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# Paper Making in the Pacific Northwest

## Engineer of the News Print Service Bureau After an Extended Trip Through This Territory Compares Present Conditions There With Conditions As They Existed in 1921—Says In Production of Sulphate Pulp Especially Is To Be Seen Most Advanced Practice on the Continent, If Not in the World

By W G. MacNaughton [1]

AS it had been seven years since leaving the Pacific Northwest, a visit during the past summer had much interest as it was possible to see the advances in production and plant operation that had taken place in the interval between then and now.

The territory considered covers northern Oregon, Washington and southern British Columbia where in 1921 there was a capacity of approximately 1460 tons of paper a day as well as the mechanical and chemical pulp required for it. The sulphite mills in British Columbia which in 1921 were the only ones making pulp for sale are not considered in this study.

### Paper Production

The production of 1460 tons of paper per day comprised 970 tons of news print, 280 tons of sulphite wrapping and allied grades, 150 tons of kraft wrapping and board (chiefly board), and 60 tons of book and writing paper.

In 1928 the paper production capacity had been increased to 2560 tons per day made up of 1570 tons of news print, an increase of 600 tons; 490 tons of sulphite wrapping and allied grades, an increase of 210 tons; 380 tons of kraft wrapping, container liner and chip board, an increase of 230 tons; and 120 tons of book and writing paper, an increase of 60 tons per day. The total increase amounted to 1100 tons per day.

PACIFIC NORTHWEST PAPER PRODUCTION

| | | 1921 | 1928 | Increase |
|---|---|---|---|---|
| Oregon | News | 350 | 425 | 75 |
| | Sulphite Wrapping and Specialties | 130 | 175 | 40 |
| | Kraft Wrapping and Board | | 55 | 55 |
| | | 480 | 655 | 170 |
| Washington | News | 145 | 400 | 255 |
| | Sulphite Wrapping and Specialties | 150 | 300 | 150 |
| | Kraft Wrapping and Board | 130 | 280 | 150 |
| | Book, etc. | 60 | 120 | 60 |
| | | 485 | 1100 | 615 |
| B. C. | News | 475 | 745 | 270 |
| | Sulphite Wrapping and Specialties | | 15 | 15 |
| | Kraft Wrapping and Board | 20 | 45 | 25 |
| | | 495 | 805 | 310 |
| Total | News | 970 | 1570 | 600 |
| | Sulphite Wrapping and Specialties | 280 | 490 | 210 |
| | Kraft Wrapping and Board | 150 | 380 | 230 |
| | Book, etc. | 60 | 120 | 60 |
| | | 1460 | 2560 | 1100 |

Figures are necessarily approximate.

In paper machines, besides the replacement of a 2-roll news print machine with another of 3-roll width, there had been added 19 additional paper machines increasing the number from 41 to a total of 56 of all types in 1928.

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In addition to the pulp required for the increased paper production, there were in operation or nearly ready to start, in Oregon and Washington, pulp plants to make approximately 40 tons of ground wood, 450 tons of sulphite and 250 tons of sulphate pulp per day.

It is to be noted from the tabulation that the greatest increase has been in news print—about 75 tons per day in Oregon, 255 tons in Washington, and 270 tons per day in British Columbia. This increase was altogether due to the addition of 5 new machines to existing mills, the replacement of 164 inch by a 234 inch machine, and the increase in production of the machines already in operation.

The class of sulphite wrapping and allied grades include tissue paper and bleached sulphite papers. The increase of 210 tons per day was due to the addition of seven paper machines, one in Oregon, five in Washington, and one in British Columbia. Four of the machines in Washington and the one in British Columbia were in new plants.

Kraft wrapping paper and boards including chip board, showed an increase of 230 tons per day, mostly on kraft wrapping paper, although kraft container liner accounts for 100 tons of it. This increase was accomplished by the installation of five new machines, two of which are board machines. These new machines were distributed one in Oregon, in a new plant, three in Washington also in two new plants, and one in British Columbia in an existing mill.

For book paper the increase of 60 tons per day, all in Washington, was due to two new machines both of which were in existing plants.

NEW PAPER MACHINES

| | Oregon | Washington | B. C. | Total |
|---|---|---|---|---|
| News | (1—234″ replacing 164″) | 1—234″<br>1—164″<br>1— 84″ | 2—234″ | 5 |
| Sulphite | 1—136″ | 3—136″<br>1—134″<br>1— 84″ | 1—132″ | 7 |
| Kraft and Board | 1—168″ | 1—6 cyl.<br>1— 94″—5 cyl.<br>1—148″ | 1—134″ | 5 |
| Book | | 1—154″<br>1—150″ | | 2 |
| Total | 2 | 13 | 4 | 19 |

### Raw Material for Pulp

In the manufacture of pulp on the Pacific Coast, while there has been a great deal of interest in the use of sawmill waste, the great bulk of the increased production such as news and book paper, has been from spruce, hemlock and cottonwood logs. On

the other hand, although there are no exact figures, it is probable that more than half of the 700 tons of sulphite and sulphate pulp, either now or soon to be on the market, is from chips produced from mill ends, slabs and edgings. In addition, some of the mills making paper also use some of this material. At the present time three sulphite mills in operation on Puget Sound and one on Grays Harbor use chips from sawmill waste. The sulphate mill at Longview, Wash., and two others soon to operate, will use this material almost exclusively.

In 1921 it is probable that 150 cords per day of clean slabs and mill ends would be a close figure of the quantity of sawmill waste used in paper mills at that time. At the present time it is likely that approximately 1000 cords per day made up of 500 cords of hemlock and an equal quantity of fir, slabs and edgings per day is a fair estimate of that going to sulphite and sulphate mills respectively instead of to the burners.

Adjoining the Long-Bell lumber mills at Longview, Wash., the Longview Fibre Company where kraft container liner is made, the pulp mill is supplied with chips produced in the saw mill from slabs and edgings and transported to the pulp mill in specially built railroad cars. When at their destination the cars are emptied into a track hopper from which the chips go to chip screens and thence over conveyor scales to the chip storage. The quantity received is determined by the weight recorded on the weightometer.

The pulp mills on Puget Sound have chipping plants in a number of saw mills and transport the chips by conveyor from the adjoining saw mills or in barges to the pulp mills and the quantity is determined by the volume.

There is undoubtedly a growing tendency in the West to apply the Swedish practice of operating saw mills and pulp mills in conjunction, supplying the pulp mills with material unsuitable for lumber and which is otherwise a waste and expense for disposal.

### Saw Mill Refuse as Fuel

At several mills it was noted that definite progress had been made in using hog refuse for the operation of the boiler plant replacing the coal or fuel oil formerly used. This has resulted partly from the development of step grates and furnaces designed for refuse burning, and also from a better knowledge of the operation of the flat grates. Both in Vancouver, B. C. and Seattle it was reported that hog refuse as well as sawdust is being quite generally used for house heating. An inexpensive automatic feeder for house furnaces has been developed by which the wood refuse is continuously fed from a storage bin to the furnace and controlled by a thermostat. According to reports there is a material saving in heating cost over coal or oil.

### Pulp Manufacture

Since 1921 there has been a considerable increase in the percentage of hemlock used for mechanical pulp, and in some mills as pared with spruce is somewhat of an objection and it is necessary to use special care in grinding it, western hemlock is otherwise high as 60 percent is ground. Although the darker color as comquite satisfactory for news print.

In regard to grinding equipment it is to be noted that pocket grinders as opposed to the plunger magazine and continuous types used in the East, are still preferred on the Pacific Coast. In the new installations the type adopted is the 4-pocket grinder with double plungers for 4-foot wood. The wood is brought to the grinders in racks by means of an overhead monorail system so that at the same time an accurate measurement of the quantity used is secured.

For control of the grinding it is customary to test the pulp for freeness and fiber length, sampling each grinder at two hour intervals.

On sulphite with the exception of the increased use of hemlock sawmill waste, there is little to be noted. The mills built since 1921 that make easy bleaching as well as bleached sulphite for the market are those which use this material to the greatest extent. Although there is rather more expense than at first anticipated in its use, the quality of the product has necessitated careful selection and cleaning. The form of material also has made necessary slab barkers and slab chippers in order to secure as clean and uniform chips as possible.

In the control of the cooking and bleaching all the modern equipment and methods are used.

### Advances in Sulphate Manufacture

In the production of sulphate pulp especially, is to be seen in the new mills on the Pacific Coast the most advanced equipment and practice on the continent if not in the world.

There is still much research to be done before the full value of Douglas fir sawmill waste is to be obtained by the sulphate process. As indicated previously, there is quite a large use of this abundant material, particularly for the second quality of kraft paper, although for the highest grade of kraft wrapping papers it has been found necessary to use hemlock. Considering the fact that according to the Forest Products Laboratory Douglas fir has an average fiber length of 4.4 mm. as compared with 2.7 mm. for western hemlock and also the superior quality of pulp obtained from fir by the soda process, it seems likely that an improvement in the product will result from further study of the cooking process.

In the chemical recovery plants of the sulphate mills, the first important equipment to be mentioned is the Nordstrom drying tower which was designed primarily for the use of dry stack gases of boiler plants to dry sawmill hog refuse for use as fuel. At one Washington mill this equipment has been applied to drying the chips going to the sulphate mill using the gases from the chemical recovery plant. Besides lowering the moisture content of the chips an attendant result has been a material reduction of the odors due to the mercaptan being absorbed by the chips during the passage of the gas. As this is the only installation of the kind on the continent used in this way, it is understood that some difficulties have been experienced, but it is hoped that these will be finally worked out in view of the many important economies, especially of heat and chemical, that should be possible by its use.

### Fidalgo Drying System

For drying and baling chemical pulp for shipment the Pacific Northwest mills are to be credited with the application of a system previously new to the paper industry. This is known as the Fidalgo system as it was first applied in the plant of Fidalgo Pulp Manufacturing Company at Anacortes, Wash. In its latest development the pulp is delivered from a Kamyr high pressure wet machine at upwards of 50 per cent dry. The sheet is then shredded on to a wire conveyor which carries the pulp through a tunnel drier supplied with steam coils or heated air. In the passage the moisture is driven off without contact with the heated metal as on a pulp drying machine of usual design. The dry shredded pulp goes from the drier to a system of baling presses by which it is compressed to the required density for boat shipment.

It is understood that by this method of drying the initial strength of the pulp is retained to a large degree. In addition the pulp in the shredded form has the advantage of being more readily defibered when it arrives at the paper mill.

As to steam economy and installation cost, there appears to be no reason why there should not also be advantages in favor of the new system.

In three new sulphate mills there are installations of recovery furnaces in which the sulphate black liquor after evaporation to a high content of solids, is completely burned and reduced to a smelt, the heat of the gases going to a boiler to make steam for a large part of the cooking and evaporating. As the design and arrangement of each of these recovery plants is somewhat different, their operation will be followed with interest by the industry in other parts of the country. For causticizing the liquor and reuse of the lime by burning the sludge as well as the recovery of the black liquor for evaporation and washing the pulp, the most modern equipment is to be seen.

Since it is known that Washington has large natural deposits of sodium sulphate in the dry area of the state on which some

development was attempted during the war, it is to be expected that this naural resource will again be invested for local use.

Taken altogether it may be stated that the sulphate mills of the Pacific Northwest represent the most advanced practice in America. Considering the abundance of material in the form of sawmill waste, otherwise an expense for disposal, which can be used as a pulp raw material as well as for fuel, the f avorable situation of the western sulphate mills is very evident.

### Paper Manufacture

With an appreciation of the abundant raw material available for paper and a knowledge of the proper method of treatment as well as the effect of the Panama Canal in opening a wider market for the products, there has resulted in the Pacific Northwest the esablishment of paper mills making equipment and practice has quite kept pace with other sections of the country, so that no differences can be observed in these respects.

In British Columbia at Powell River an opportunity was afforded of studying in some detail the arrangement and operation of the condensate removal system developed by R. Bell-Irving and P. Sandwell. Two news print machines 234 inches in width and operating close to 1,000 feet a minute are equipped with it and operating satisfactorily.

At the plant of Inland Empire Paper Company, Millwood, Wash., many important improvements were noted.

As the raw material available consists of spruce, white fir and hemlock logs of moderate size, the best middle western practice has been applied in the wood storage. The yard is well supplied with railroad tracks and the logs are stacked in long skidways by locomotive cranes with grab buckets. The same equipment is used for reloading the logs for the plant, the system being extremely economical of labor.

In the paper mill a central mixing system and also a central vapor exhaust and heat recovery system for the three paper machines have been developed, both of which are covered by patents.

# PULP AND PAPER MILLS

**Showing Number of Firms owning Mills, together with the number of Paper and Pulp Mills in the United States, Canada and Newfoundland. Table compiled from Lockwood's Directory, 1929 Edition**

| Location | Number of Firms | Number of Paper Mills | Number of Pulp Mills whether Connected with Paper Mills or Not | Number of Ground Wood Mills | Number of Sulphite Pulp Mills | Number of Soda Pulp Mills | Number of Sulphate Pulp Mills | Number of Miscellaneous Pulp Mills |
|---|---|---|---|---|---|---|---|---|
| Alabama | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 0 |
| Arkansas | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| California | 11 | 14 | 2 | 1 | 1 | 0 | 0 | 0 |
| Colorado | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Connecticut | 34 | 37 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delaware | 6 | 8 | 1 | 0 | 0 | 1 | 0 | 0 |
| District of Columbia | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| Georgia | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hawaiian Islands | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Illinois | 27 | 30 | 1 | 0 | 0 | 0 | 0 | 1 |
| Indiana | 22 | 31 | 0 | 0 | 0 | 0 | 0 | 0 |
| Iowa | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Louisiana | 10 | 11 | 7 | 0 | 0 | 0 | 7 | 0 |
| Maine | 23 | 31 | 39 | 20 | 14 | 4 | 1 | 0 |
| Maryland | 10 | 10 | 2 | 0 | 0 | 2 | 0 | 0 |
| Massachusetts | 66 | 103 | 4 | 1 | 2 | 1 | 0 | 0 |
| Michigan | 40 | 58 | 13 | 4 | 6 | 0 | 3 | 0 |
| Minnesota | 11 | 13 | 9 | 5 | 2 | 1 | 1 | 0 |
| Mississippi | 2 | 2 | 2 | 0 | 0 | 0 | 1 | 1 |
| Missouri | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Hampshire | 22 | 30 | 10 | 5 | 5 | 0 | 0 | 0 |
| New Jersey | 39 | 47 | 1 | 0 | 0 | 1 | 0 | 0 |
| New York | 128 | 156 | 74 | 55 | 15 | 4 | 0 | 0 |
| North Carolina | 5 | 5 | 5 | 0 | 1 | 1 | 2 | 1 |
| Ohio | 52 | 59 | 2 | 0 | 0 | 1 | 0 | 1 |
| Oregon | 7 | 6 | 10 | 3 | 6 | 0 | 1 | 0 |
| Pennsylvania | 54 | 64 | 15 | 1 | 4 | 9 | 1 | 0 |
| Rhode Island | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Carolina | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 |
| Tennessee | 7 | 4 | 5 | 0 | 0 | 1 | 0 | 4 |
| Texas | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 0 |
| Vermont | 12 | 12 | 3 | 3 | 0 | 0 | 0 | 0 |
| Virginia | 10 | 13 | 10 | 2 | 1 | 3 | 3 | 1 |
| Washington | 23 | 15 | 26 | 6 | 13 | 2 | 5 | 0 |
| West Virginia | 7 | 6 | 2 | 1 | 1 | 0 | 0 | 0 |
| Wisconsin | 45 | 60 | 50 | 24 | 20 | 0 | 6 | 0 |
| Total in United States | 635* | 846 | 300 | 133 | 92 | 32 | 34 | 9 |
| Canada: | | | | | | | | |
| British Columbia | 6 | 4 | 10 | 3 | 5 | 0 | 2 | 0 |
| Manitoba | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 |
| New Brunswick | 3 | 2 | 7 | 2 | 4 | 0 | 1 | 0 |
| Nova Scotia | 7 | 0 | 9 | 9 | 0 | 0 | 0 | 0 |
| Ontario | 34 | 38 | 40 | 24 | 14 | 1 | 1 | 0 |
| Quebec | 43 | 45 | 58 | 35 | 17 | 1 | 5 | 0 |
| Total in Canada | 90* | 90 | 126 | 74 | 41 | 2 | 9 | 0 |
| Newfoundland | 3 | 2 | 5 | 3 | 2 | 0 | 0 | 0 |
| Idle Mills: | | | | | | | | |
| United States | 51 | 46 | 21 | 12 | 3 | 2 | 3 | 1 |
| Canada | 8 | 4 | 4 | 1 | 1 | 0 | 2 | 0 |
| Newfoundland | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |

* Firms listed in several States and Provinces, in which they have mills but deductions made for duplicates in totals for United States and Canada.

From the sulphite mill a quantity of the waste sulphite liquor at its highest concentration, sufficient to supply the local road commission with road dressing is recovered, the liquor being applied by sprinkler trucks.

Since eastern Washington has an extremely dry climate with practically no rain during the summer months, waste sulphite liquor on the unpaved roads has been found particularly valuable.

In recovering the liquor, a small centrifugal pump is applied to the blowpits which delivers the first drainage to an elevated tank from which the sprinkler tanks are filled.

## Hammermill Builds

Preliminary construction work is already under way for the Pacific Coast paper mill which is to be an extension of the activities of the Hammermill Paper Company. The paper mill will be operated in connection with the pulp mill as the Grays Harbor Pulp and Paper Company.

The mill will be of reinforced concrete construction throughout. The paper mill equipment will consist of a Fourdrinier paper making machine, 202 inches wide, of the latest improved type made by Beloit and Bagley & Sewall, eight 2,000 pound beaters supplemented by a battery of Jordans, and the latest type of finishing equipment. The location permits of either water or rail shipment.

The paper mill will have an initial capacity of 50 tons, devoted to sulphite bond, ledger, writing and specialties. A modern steam power and electric plant will supply steam and current. The sulphite mill has a capacity of 175 tons.

The mill is located in Hoquiam, Wash., which together with its sister city, Aberdeen, are modern and thriving communities with a total of about forty-five thousand inhabitants.

Grays Harbor, on which both of these towns are located, is the most important shipping point for lumber on the Pacific Coast and more lumber is being shipped out of this port than any other port on the coast.

# National Paper Products Co. Starts New Mill

## Most Recent Addition to the Crown-Zellerbach Group Began Operations at Port Townsend, Wash., Oct. 6—First Unit Contains One 130-Inch Seven Black-Clawson Cylinder—Second Unit To Have 253-Inch Kraft Fourdrinier, the Largest in the World

THE first unit of the National Paper Products Company's kraft pulp and paper mill at Port Townsend, Wash., went into production on October 6, 1928, when the first digester was blown. This mill is the most recent addition to the Crown-Zellerbach group.

### Two Complete Units

The mill is divided into two complete units, each of 100 tons daily capacity. The first unit, which has commenced operations, produces kraft liner used in the manufacture of solid fiber and corrugated shipping cases. The second unit will be completed after the first of the coming year and will produce 100 tons of kraft paper.

The mill is located on a 287 acre site approximately three miles southwest of the city of Port Townsend, Wash. Part of the site consists of tide lands and part of land obtained as a result of the necessary dredging operations to produce water of sufficient depth to allow the largest ocean going vessels to take on or discharge their cargoes at the plant docks. The mill is also served by the Chicago, Milwaukee & St. Paul Railroad, permitting in addition rail shipments.

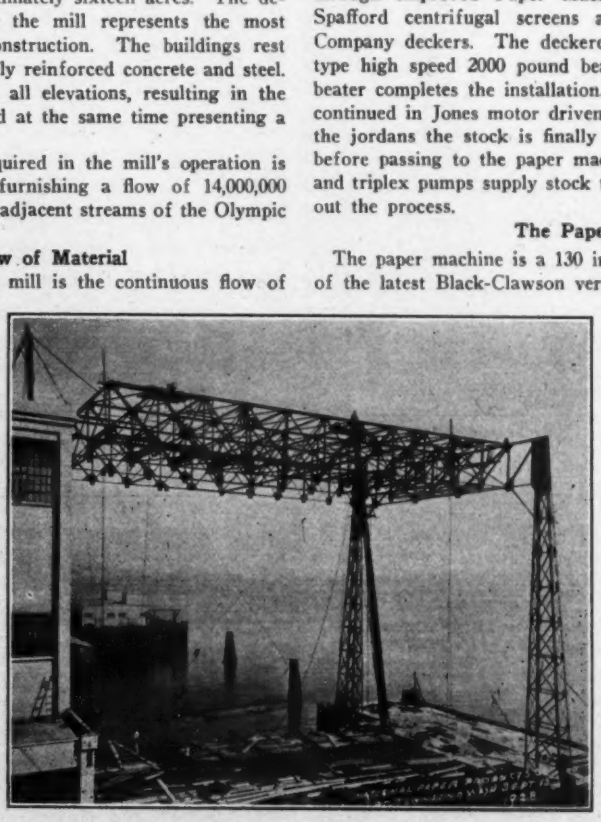
### Most Modern Mill Construction

The mill, when complete, will occupy a ground area of seven acres with a floor area of approximately sixteen acres. The design of the buildings composing the mill represents the most modern thought in paper mill construction. The buildings rest on pile foundations and are entirely reinforced concrete and steel. Steel sash has been employed on all elevations, resulting in the maximum use of natural light and at the same time presenting a most pleasing architectural effect.

The large volume of water required in the mill's operation is supplied by a 31 mile pipe line furnishing a flow of 14,000,000 gallons of water per day from the adjacent streams of the Olympic Mountains.

### Continuous Flow of Material

The outstanding feature of the mill is the continuous flow of materials as they are converted from the raw to the finished state. Incoming raw materials and fuel are received by barge and boat. The barges are unloaded with 4 lines of Pawling & Harnischfeger Monorail equipment supported by an overhead steel structure 110 feet long, 100 feet above the water. One end of the steel structure rests on the concrete raw material storage buildings and the other on two steel towers on concrete piers. Beyond these towers is a large unloading wharf where boats may discharge their cargo to be subsequently handled by the Monorail system. It is possible to convey raw materials directly to the point where processing begins or to storage.



MATERIAL HANDLING GANTRY TO ISLAND

The first unit contains three Kellogg stationary forge and hammer lap welded steel digesters. Cooking is done indirectly with the aid of Moterud heaters and circulating pumps. The pulp is blown into a large blow cyclone and then passes through Oliver washers. The resulting black liquor and pulp are accumulated in large concrete chests. From here the black liquor is pumped to the recovery room by Allis Chalmers centrifugal pumps. The black liquor is concentrated from 11 degrees Baumé to 70 per cent solids in a Buffalo vertical rapid circulation type evaporator having a quadruple effect with one finishing pan or concentrator. The concentrated black liquor is sprayed into smelter furnaces lined with chrome brick. Here the soda is recovered and the waste heat utilized to generate steam.

The causticizing plant is of the batch type, the equipment including two green liquor settling tanks, one causticizer and ten settling tanks. Concrete chests provide ample storage of white liquor.

### Causticizing Plant

Adjacent to the causticizing plant is a Manitowoc rotary lime kiln 110 feet long by 8 feet in diameter, for recovering lime from the sludge. An Oliver mud filter de-waters the lime sludge before entering the kiln.

The pulp, after leaving the Oliver washers, passes successively through Improved Paper Machinery Company knotters, Reed-Spafford centrifugal screens and Improved Paper Machinery Company deckers. The deckered stock is refined in Jones Best type high speed 2000 pound beaters. A Dilts high speed broke beater completes the installation. Hydration of accepted stock is continued in Jones motor driven Majestic jordans. After leaving the jordans the stock is finally screened in Packer plate screens before passing to the paper machine. Batteries of Beloit duplex and triplex pumps supply stock to the various equipment throughout the process.

### The Paper Machine

The paper machine is a 130 inch, seven cylinder board machine of the latest Black-Clawson vertical drier type and will trim approximately 112 inches. There are four main presses and 98 drier rolls 42 inches in diameter by 146 inch face. Condensate is removed by a Farnsworth double separating drying system, and vapors exhausted by means of a transite hood and Clarage fans. A modern two drum upright, belt-driven reel of the removable drum type and a two drum Langston winder with slitting attachments completes the dry end of the machine.

Two features of the installation are the employment of a Westinghouse sectional drive on the entire machine from the cylinder molds to the rewinder and the location of the Shartle fan pumps on a mezzanine platform below the operating floor.

The finished rolls are stored

PLANT OF THE NATIONAL PAPER PRODUCTS CO., PORT TOWNSEND,

in a large roll pit and warehouse with the aid of a Pawling & Harnischfeger traveling crane and several units of Elwell Parker electric lift trucks.

### The Power Plant

The mill is served by a power plant of the very latest design. The installation consists of 5—838 hp. Stirling type boilers, generating steam at 375 pounds pressure. The boilers are fired by hog fuel and oil. Draft is produced by a 250 foot concrete stack, erected by the Rust Engineering Company. Water for the boilers is softened by a Permutit system and before entering the boilers passes through a Cochrane Open Heater and a Croll-Reynolds Closed Heater. Mechanical hog fuel stokers of original design complete a very modern boiler plant.

The prime movers consist of one 3750 KVA General Electric extraction type condensing turbo-generator and one 625 KVA Westinghouse non-condensing turbo-generator. With the completion of the second unit there will be, in addition to the above, three more 3750 KVA General Electric double extraction condensing type turbo-generators with additional boilers to serve them.

A high station power factor is obtained by the use of synchronous motors wherever possible, particularly on the large loads, such as beaters, jordans, motor generator sets, etc.

### To Install 253 Inch Kraft Machine

A few interesting facts regarding the first unit of the mill are that there were involved in its construction, 650,000 yards of dredging, 7,500 piles, 16,000 cubic yards of concrete, 1,000 tons of reinforcing steel, 1,100 tons of structural steel, over 2,000,000 brick, 21 carloads of pipe, with marine and rail shipments of equipment totaling approximately 10,000 tons. The second unit, now under construction, will be a duplicate in most respects of the present unit, with the noteworthy feature that there will be installed a 253 inch, 1,000 feet per minute Fourdrinier machine, the largest kraft machine in the world.

V. D. Simons, of Chicago, is responsible for the entire layout, design and construction of the mill. H. N. Simpson served as his representative in the field in the capacity of resident engineer.

## Construction of New Nekoosa Mill Progressing

Steady progress is being made at the plant of the Nekoosa-Edwards Paper Company at Nekoosa, Wis., with the construction of a new wet machine room, bleach plant and storage building, 311 feet long and 83 feet wide, having a fourteen foot basement and a first floor height of eighteen feet to the trusses. This building will house a 100 ton bleach plant and machinery for deckering, washing and lapping the kraft pulp. It is planned to have the new mill in full production by July 1, 1929.

The Nekoosa-Edwards Paper Company is now operating a 60 ton kraft mill and a 40 ton sulphite mill at its Nekoosa plant, and according to their present plans the equipment of the 40 ton sulphite mill will be dismantled and removed and provision made for an increase of production to 150 tons of kraft per day with provision for a maximum of 180 tons per day, later.

Some of the old machines will be moved to the new building but nearly all equipment will be new. This will consist of IMPCO Knotters, Bird and Thune Pulp Screens, Oliver Washers, one 7 foot by 16 foot Marcy rod mill, and one 120 inch Kamyr single press feltless wet machine.

In the old sulphite digester building will be located three new five ton kraft digesters with provision for the fourth. Digesters to be furnished by Manitowoc and lined by Stebbins Engineering and Manufacturing Company. Moterud heaters will be used in connection with the new digesters.

The present blow pit and wet rooms will be remodeled to accommodate two batteries of diffusers with space for a third battery. The present acid plant buildings will be used for causticizing and liquor storage tanks.

A large addition will be built on the recovery room to house three new recovery units with space for a fourth. The entire mill is being planned and built by the operating and engineering forces of the company, headed by John E. Alexander, first vice-president and general manager.

## Northern Paper Mills Expand

The Northern Paper Mills is adding to its plant at Green Bay, Wis., a new building of structural steel, brick and reinforced concrete to be 114 by 300 feet, three stories high and of strictly fireproof construction.

The addition is made a necessity through the expansion of the company's specialties, such as Northern Tissue, Northern Towels and Northern Cabinet Tissue. The plant will be rearranged so that the conversion of its products will be concentrated in the new addition, part of which will be devoted to storage and shipping. This concentration of the company's equipment in the new addition will release space in the older part of the mill for handling of orders and storage of parent rolls.

When it is finished it is believed that the portion of the building devoted to conversion will be one of the most modern conversion plants devoted to the finishing of tissue papers.

# Camden Kraft Mill Now In Complete Operation

## Fifth Modern Kraft Paper Mill of International Paper Co. in South Has Capacity of 160 Tons Daily—Total Capacity of Five Plants Is Approximately 700 Tons Per Day—Construction Commenced on New Paper Mill at Mobile, Alabama

CONSTRUCTION on the new kraft paper and pulp mill of the International Paper Company, at Camden, Arkansas, started on March 7, 1926, and so rapidly did the work progress that the plant was completely finished and the two paper machines in operation early this year. Incidentally, the first machine began production less than eleven months after the beginning of construction on the mill.

### First Paper Mill in Arkansas

Located in the southern part of the state, the Camden mill is the first paper mill in the State of Arkansas. It has a capacity of 160 tons of kraft paper a day and is the fifth modern kraft paper mill of the International Paper Company in the southern United States. The total capacity of these five plants is approximately 700 tons of kraft paper per day. The International Paper Company is already the largest producer of kraft paper in the world.

The Camden mill is in the fast-growing short leaf and loblolly pine belt. Because of their long fibers, freedom from pitch and greater uniformity of texture, these species of pine are better adapted than others to the manufacture of kraft paper. These pines are naturally very prolific seeders and grow much faster than northern spruce, producing pulpwood in fifteen to twenty year periods, as compared to three to four times that rotation for spruce in the northern part of the continent.

Following are the specifications on the construction of the Camden Mill:

Paper Mill Section, machine room, beater room, finishing and shipping room: One building 780 feet long, by 108 feet wide, 48 feet high, reinforced concrete brick and steel construction; gypsum roof with Barrett AA covering; one story with 17 foot basement.

Pulp Mill Section, wood room: Reinforced concrete, brick and steel construction with corrugated asbestos roof, 88 feet 6 inches long by 70 feet wide and 40 feet high: two story.

Recovery room: Reinforced concrete, brick and steel construction with corrugated asbestos roof, 199 feet long, 106 feet wide and 54 feet high; two story.

Caustic Plant: Settling and Filter House: Reinforced concrete brick and steel construction with corrugated asbestos roof; two story; 103 feet long, 52 feet wide and 50 feet high.

Slack room: 45 feet long, 32 feet wide, 23 feet high; reinforced concrete, brick and steel construction with corrugated asbestos roof.

Salt Cake Building: 180 feet long, 45 feet wide, 23 feet high; reinforced concrete, brick and steel construction with corrugated asbestos roof.

Digester-Diffuser-Evaporator Building: Reinforced concrete, brick and steel construction; concrete roof with Barrett AA covering; 108 feet long, 98 feet wide, 85 feet high.

Wet Room: Reinforced concrete, brick and steel construction concrete roof and Barrett AA covering, 96 feet wide, 98 feet long, 49 feet high.

Switchboard Room: Reinforced concrete, brick and steel construction with gypsum roof and Barrett AA covering; 18 feet wide, 108 feet long.

Boiler House: Reinforced concrete, brick and steel construction with concrete roof and Barrett AA covering, 96 feet wide, 98 feet long, 49 feet high.

Machine Shop and Supply House: Reinforced concrete, brick and steel construction with corrugated asbestos roof 129 feet long, 90 wide, 36 feet high.

Concrete Reservoir: 78 feet by 40 feet by 7 fet deep. 150,000 gallons.

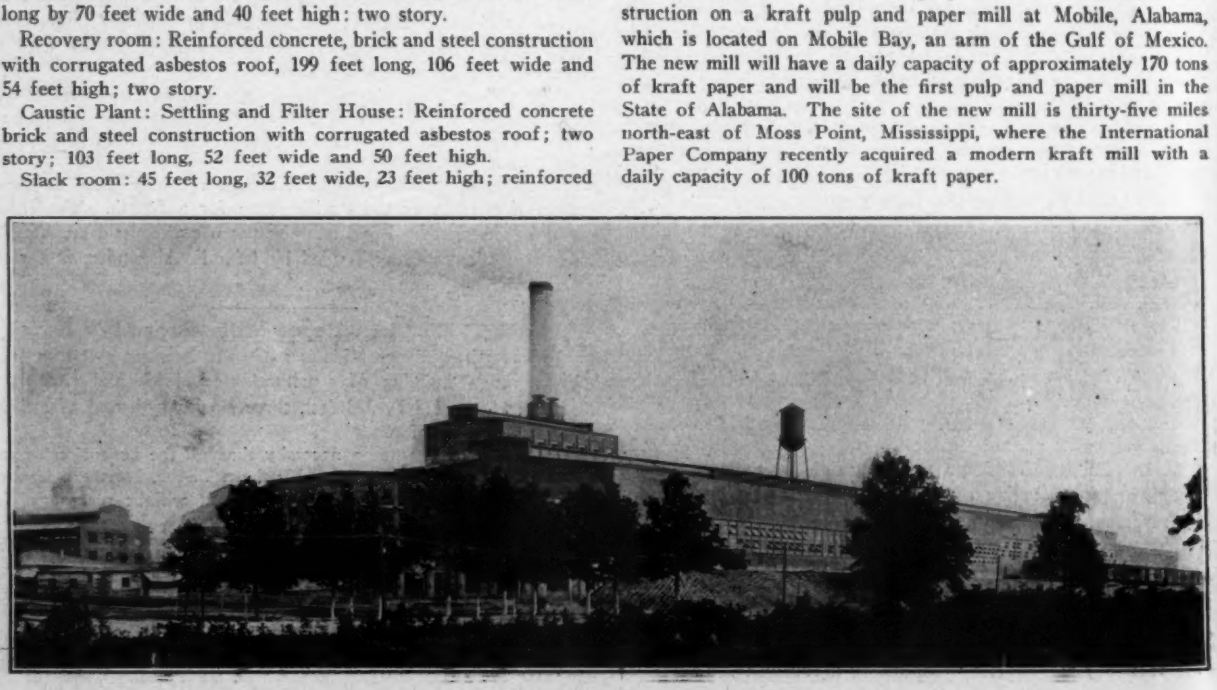
Water Tower and Tank: 75,000 gallon steel tank on 111 foot high tower with concrete foundations.

Bark Burner: 28 feet diameter, 60 feet high; concrete foundation; steel shell brick-lined.

Sprinkler System: Underground lines 4,800 feet piping, fourteen hose hydrants: hose houses.

### New Kraft Plant for Alabama

The International Paper Company has also commenced construction on a kraft pulp and paper mill at Mobile, Alabama, which is located on Mobile Bay, an arm of the Gulf of Mexico. The new mill will have a daily capacity of approximately 170 tons of kraft paper and will be the first pulp and paper mill in the State of Alabama. The site of the new mill is thirty-five miles north-east of Moss Point, Mississippi, where the International Paper Company recently acquired a modern kraft mill with a daily capacity of 100 tons of kraft paper.



NEW KRAFT MILL OF THE INTERNATIONAL PAPER CO. SOUTHERN DIV., CAMDEN, ARK.

# Southern Advance Bag & Paper Starts Mill

## Plant Makes Its Own Pulp and Has Capacity of 100 Tons of Kraft Paper Daily—Present Installation Is One 242-inch Fourdrinier, the Largest At Present in Operation — Thirty Bag Machines, Patented by the Company, Also Operated

ONE of the outstanding mills constructed during the year is that of the Southern Advance Bag and Paper Company, of Hodge, La., a subsidiary of the Advance Bag and Paper Company, of Boston, Mass., Howland, Maine, and Middletown, Ohio This mill, of concrete and brick, of which practically all the construction work and all of the piping was done by the company, has been in complete operation since May, the pulp mill starting in April. Increasing business from Southern trade compelled the company to construct the new plant and it was also needed to supply the Middletown mill with paper for the manufacture of bags. The mill was designed and built by C. A. Ring, the company's engineer.

POWER PLANT WITH SPRAY POND IN FOREGROUND

The company has taken advantage of the latest developments for a modern paper mill in the construction and equipment throughout. The 242-inch Fourdrinier, with a trim of 220 inches, made by Pusey & Jones, Wilmington, Del., is the largest Kraft paper machine now in operation in the United States. There is sufficient space allowed for the installation of another Fourdrinier machine near the present one, if needed. This machine has a daily capacity of 100 tons of kraft paper. A large proportion of this is used in the bag plant at the mill, but much is sold to the general market.

About thirty bag machines, made in the company's own shops at Middletown and patented by the Advance Bag and Paper Company, are in operation. C. S. Jackson, vice-president of the Advance Bag and Paper Company, invented the machines and brought them to perfection.

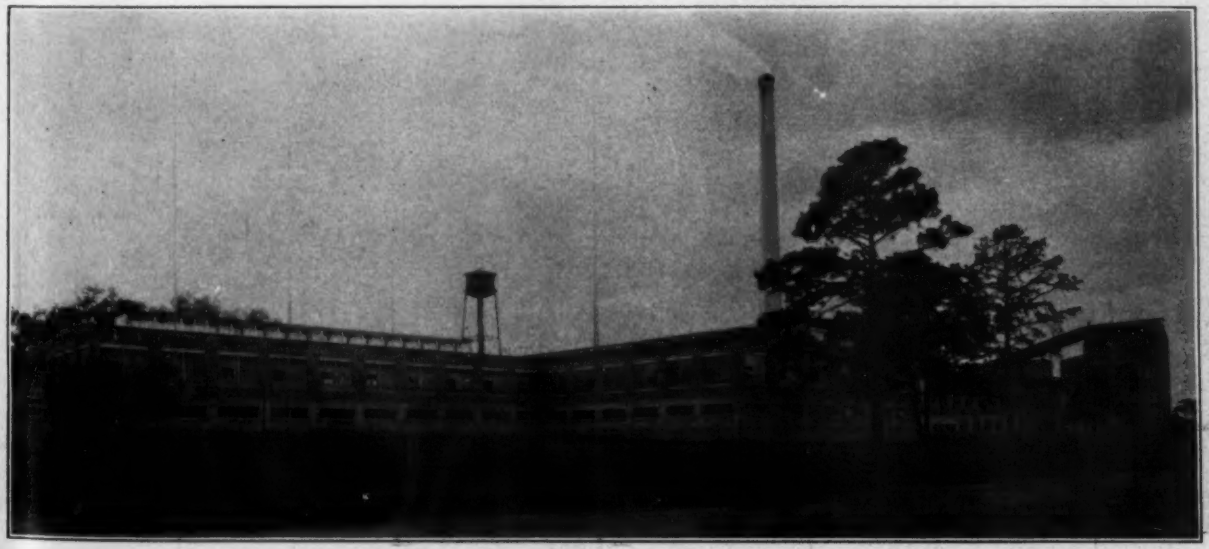
The three beaters were furnished by the Dilts Machine Works, Inc., of Fulton, N. Y., and the six jordan refining engines by the Appleton Machine Works, of Appleton, Wis.

The equipment of the pulp mill includes barking drums manufactured by the Manitowoc Engineering Company, of Manitowoc, Wis., a Scott Evaporator, made by the Ernest Scott & Co., Fall River, Mass.

The heaters were made by Skinner Brothers, of St. Louis, Mo. The four steel digesters were supplied by the Blaw-Knox Company, of Pittsburgh, Pa., and diffusers and tanks furnished by the Walsh and Weidner Company, of Chattanooga, Tenn.

The pumps are a product of the Warren Steam Pump Company, of Warren, Mass.

In both pulp and paper mills, screens made by Bird & Son, Walpole, Mass., are used.



KRAFT PULP AND PAPER PLANT OF SOUTHERN ADVANCE BAG & PAPER CO., HODGE, LA.

A notable feature of the mill is the power plant, which consumes natural gas. This is secured by a pipe line from the gas fields of Monroe, La., about 45 miles distant. For this purpose foreign pipe is used. The burners are the product of the Duquesne Burner and Equipment Company, Pittsburgh, Pa. Three 750-horse power watertubed boilers, built by Walsh and Weidner Company, and 300 horse power boilers, from the Erie City Iron Works, of Erie, Penn., are used in the plant. The total horse power is 3150 when all the boilers are at capacity. These boilers all have Foster Economizers and Superheaters, and also Sturtevant Economizers, manufactured by the B. F. Sturtevant Company, Hyde Park, Boston, which are used on the boilers from the Erie City Iron Works. Worthington Feed water heaters, made by the Worthington Pump and Machinery Company, also make for efficiency in the power plant. Condensers for the turbines, from the C. H. Wheeler Manufacturing Company, of North Philadelphia, Pa., are used. The water supply is obtained from artesian wells, installed by the Layne Louisiana Company, of Lake Charles, La., and by Fred S. Getty, of Jennings, La.

ELECTRIC POWER PLANT AT HODGE, LA.

The General Electric Company furnished all the electric and turbine equipment, which includes 3-2500 kilowatt turbo-generating sets.

Save-alls were made by the Glens Falls Machine Works, Glens Falls, N. Y.

High pressure valves and fitting valves were furnished by the Walworth Company, of Boston, and the piping and fittings by the Grinnell Company, of Providence, R. I., through the Boston Pipe and Fitting Company.

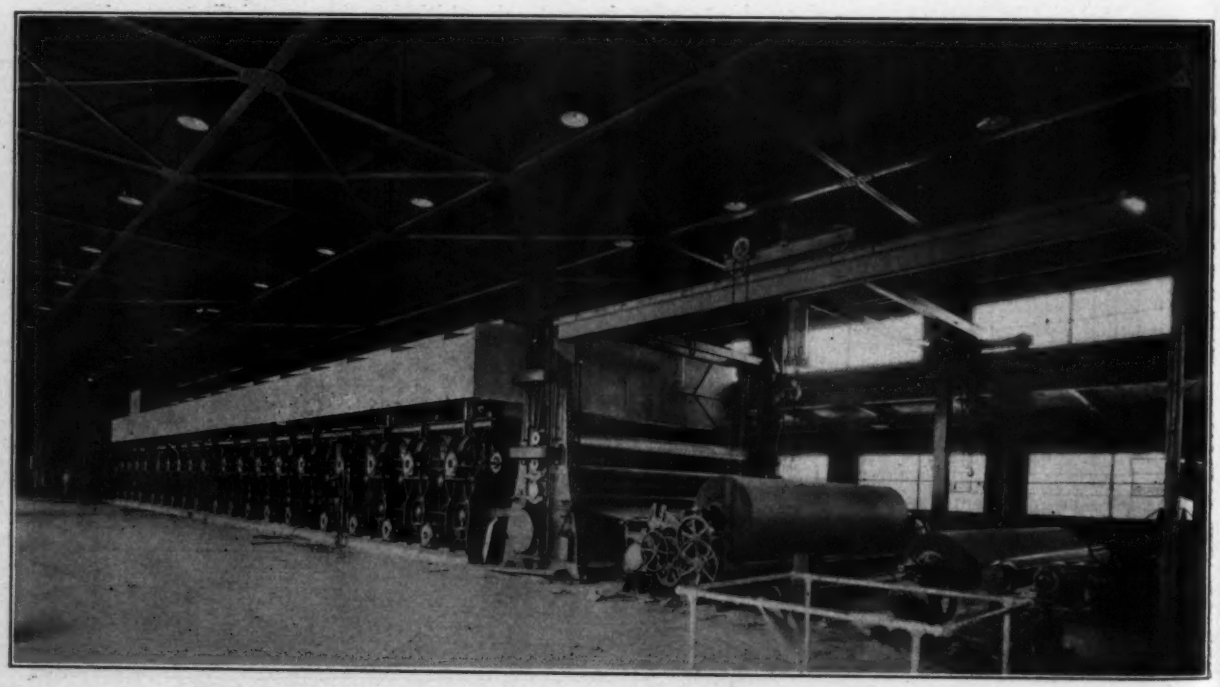
Steel trusses are used in the construction of the buildings. The mill has an ample number of elevators, installed by the George T. McLauthlin Company, of Boston. All the buildings of the plant are of slow-burning roof construction.

A conspicuous feature of the exterior of the plant is the 300-foot concrete chimney, erected by the Heine Chimney Company, of Chicago, Ill., which is seen in the picture. The view containing the chimney shows also the spray pond, recovery room, boiler house and power house.

Ground was broken for the mill on September 3, 1927, and, as previously noted, the manufacture of pulp began in April and that of paper in May. About 400 are employed in the plant. Part of the paper is converted into Advance paper bags at Hodge and at Middletown, Ohio, all of which are merchandised by the Advance Bag and Paper Company, together with the balance of the paper production, which is marketed as wrapping paper to the jobbing trade. The company sells in addition the product of the Howland, Ill., and Middletown, Ohio, mills. The concern ships goods extensively to various parts of this country and also exports them to the West Indies.

The company owns tracts of timber land in Louisiana, from which the wood for the pulp is obtained. The concern took over the properties of the Hodge-Hunt Lumber Company, which formerly operated a saw-mill in Hodge. The North Louisiana and Gulf Railroad, of which O. E. Hodge and J. S. Hunt are officers, and used for conveying the pulp wood to the mill, is the property of the Southern Advance Bag and Paper Company. This railroad is also employed for in-coming and out-going freight.

The Advance Bag and Paper Company owns many dwelling



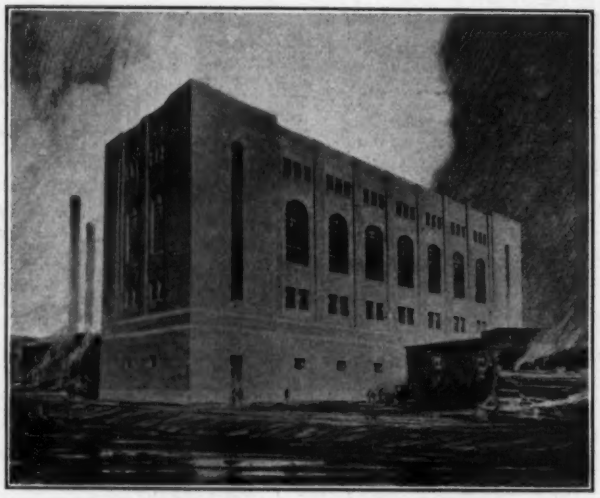
PUSEY & JONES FOURDRINIER 242 INCHES WIDE, THE LARGEST KRAFT MACHINE IN THE COUNTRY

houses in the town of Hodge and has built a large number for its employees. The company also owns a general store, drug store, barber shop, and other necessary stores for the residents of the town.

The business of the concern started in Middletown in 1901 under the name of the Advance Bag Company. In 1921, combination with the Howland Pulp and Paper Company was effected, when the Advance Bag and Paper Company was formed. The operation and volume of production has been increasing continually. There are two distinct corporations. The Advance Bag and Paper Company has a Maine charter and the Southern Advance Bag and Paper Company also is incorporated under the laws of that state. Of this Company John E. Kelley, of Bangor, is president; J. N. Harvey, of Boston, vice-president and treasurer, and Paul D. Caskey, of Boston, secretary, Mr. Caskey is purchasing agent for both companies.

# New Interlake Sulphite Digester Room

The Interlake Mitscherlich Sulphite mill at Appleton, Wis., was erected in 1891 by two men who later became historic figures. Commander Robley D. Evans, "Fighting Bob" to every Yankee sailor, was in charge of actual construction work. Frederick W. Taylor, the engineer who blazed a pioneer's trail for our modern industrial efficiency systems, acted as general manager of the concern for several years. Under the direction of these two keen minds eight large stone and cement stock pits were erected on the East bank of the Lower Fox River at Lock No. 4, Appleton, Wis. Eight steel shells, thirteen feet inside and forty feet long were built at Cleveland, Ohio. These shells were towed to Green Bay, and after much "tugging" and sustained prayer for high water on the Fox the sixty-ton vessels were landed at the new mill site.



NEW INTERLAKE DIGESTER BUILDING

### Fighting Bob Despaired

"Fighting Bob" despaired of the job of getting these shells out of the river and up the steep bank onto the thirty foot high stone piers. Herman Wildhagen, an assistant engineer still living in Appleton, hired a team of sturdy horses, built some long lumber jack skidways and easily rolled the shells up the skids and on to their supporting cradles. 'Tis said that Evans' famous "right-hand lower desk draw" furnished adequate celebration. For thirty-five years these digesters have continued to produce their famous brand of "Interlake Genuine Mitscherlich Sulphite Pulp."

A new digester building housing nine new shells is now displacing this original digester equipment. The new building sixty-one feet wide and three times as long thrusts its end out almost to the river's edge. Its cream colored walls of pressed brick rise ninety-five feet in the air. Heavy battlemented pylons at each corner, together with deep setting, high arched windows and white stone sills and belt courses give the building an architectural beauty entirely absent in the usual sulphite digester building.

### The Ventilating System

All glass is set in solid window frames as a modern heating and ventilating system equipped with washing and tempering coils will furnish fresh clean air to the cooks and helpers. Further the ventilation thus obtained will prevent destructive air currents from reaching the digesters.

### The Digesters

The digesters themselves are 1⅛ inch flange steel plates fourteen feet inside diameter and forty feet long. Heavy box beam girders support the expansion roller blocks, steel cradles and the entire digester load of about three hundred fifty tons each. Some seven hundred feet of coppor tubing, placed within each digester, furnishes the indirect heating for a genuine Mitscherlich Cooking schedule. All controls for each of the nine units, consisting of steam valves, relief and blow off valve controls, hydraulic operated cover hoists, steam traps and recording instruments, are located on the front or operating end. Hence the cook will have a close control of every detail of operation.

### Heavy Steel Framed Chip Bins

Heavy steel framed chip bins above will hold sixty cords of chips for each digester. The stock pits directly under each shell will hold two cooks or twenty-eight tons of pulp. Specially designed drainer bottoms in the blow pits are further guarded by a save all to prevent any stock loss. A double centrifugal pump, arranged to operate either in parallel or in tandem will furnish both high and low pressure water for the characteristic Mitscherlich cooling system. Hydraulic valves operated from the main floor will control the draining of blow pits and stock sluice ways. Slime and dirty water are barred by an entire water piping system of copper.

An electric elevator at the east end of the building, plus several stairways gives access to every floor of the building. Besides the electric elevator, a ninety foot high bucket belt elevator will lift the chips from the ground level to the thirty inch belt which distributes the chips the entire length of the building.

Special training classes for the entire digester room crew are being held daily in the new building so as to familiarize each man with every detail of the new equipment. This together with careful setting of every detail will make it possible to continue present standards of production without interruption when the final move is made from the old to the new mill.

## Dexter Sulphite Co. Makes Improvements

The Dexter Sulphite Pulp and Paper Company, Dexter, N. Y., is erecting a building to house its new screening department, bleaching department and the Howland Bag and Paper Company's bag factory, which will occupy the top floor. The building consists of two floors and basement.

The company will also install a new filter system, Kamyr wet machine and all the necessary equipment.

The company expects, on the completion of these improvements, to produce a much cleaner grade of unbleached Mitscherlich, in addition to a daily tonnage of about 20 tons of bleached Mitscherlich.

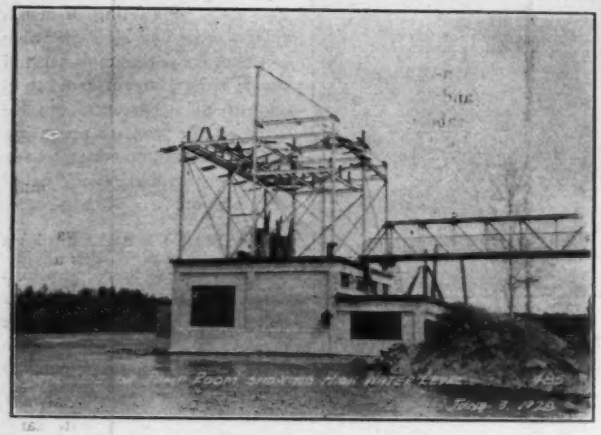
# Lake St. John Paper Mill Begins Operation

## Two New Machines Already Installed at Dolbeau Plant of Lake St. John Power & Paper Co., Ltd., With Total Capacity of 220 Tons of News Print Daily—Provisions Made for Future Extension, Four Additional Paper Machines, and One Wrapping Machine

THE 220 ton news print mill of the Lake St. John Power and Paper Company, Ltd., recently started operation in the Lake St. John district, at the new town named Dolbeau. The new mill is located twenty miles north west of the lake on the Mistassini River, just below the mouth of the Mistassibi and Rat rivers. The company owns timber leased from the Quebec Government on both these rivers covering an area of over 1,000 square miles, a short distance away, so that pulpwood is supplied to the mill at a low cost.

### Company Formed in 1926

The company was formed in the spring of 1926. E. A. Wallberg is president; John Stadler is general manager. The company designed and built the entire development under the direction and supervision of the general manager.



PUMP ROOM SHOWING HIGH WATER LEVEL

### Transportation Problems Solved

The construction of mill buildings started in November, 1926, and first paper machine turned over in December, 1927, commercial paper made since February 6, 1928. Transportation was the main problem during the construction of the mill as the nearest railway was 25 miles from the mill site, but a railway extension was made during 1927, and the first train arrived at the mill yard on September 11, 1927.

Most of the material and construction equipment required in the building of the Dolbeau mill and town site, was transported during the relatively short season of navigation by water, from the government wharf at Roberval to the mill site, a distance of 42 miles, and not less than 7,500 tons were hauled by sleigh and motor trucks from St. Felicien, a 25 miles overland route. Dolbeau is located on the St. Felicien Extension of the Canadian National Railway. Most of the building material was transported by water from the railroad dock to the mill site, a distance of 42 miles.

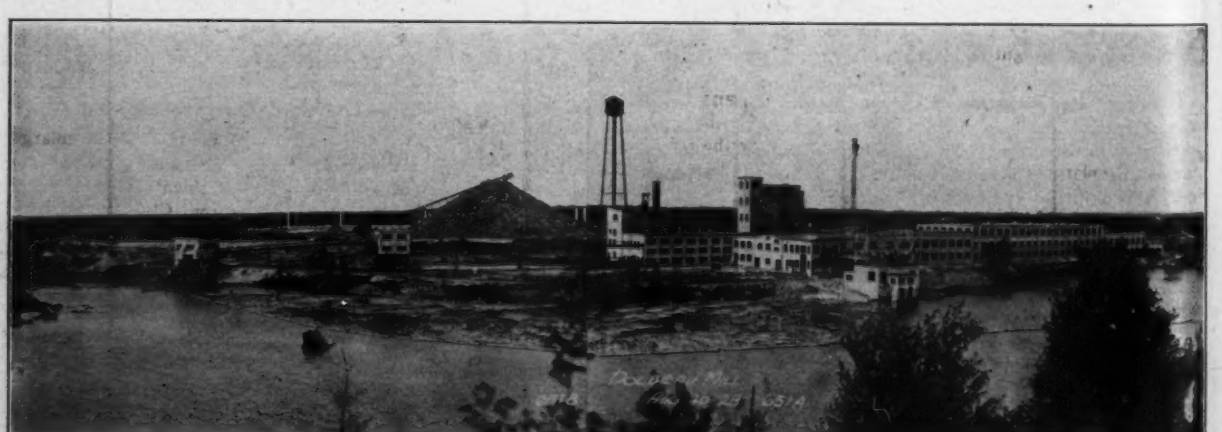
REVOLVING LOG STACKER

### Power From Duke-Price

The power requirements are obtained from the Duke Price Power Company at Isle Maligne, 38 miles from the mill site, which is transmitted on a long span type steel tower two circuit line at 110,000 volts.

### Opened by Prime Minister

The news print mill of the Lake St. John Power and Paper



PLANT OF THE LAKE ST. JOHN POWER & PAPER CO., LTD., DOLBEAU, QUE.

STREET VIEWS IN THE NEW PAPER MILL TOWN OF DOLBEAU, QUE.

ince of Quebec, who was very favorably impressed with the magnitude of the enterprise and efficiency required to complete the enterprise in such a short time.

### Mill Modern in Every Respect

The mill is modern in every respect, and the layout was made in such a way as to eliminate waste spaces and to operate at low labor cost. Provision has been made for extension and additional paper machines can be added without disturbing the present unit, the ultimate aim is six news print machines and one wrapping machine. Two news print machines are now installed.

### Wood Handling Equipment

There are some good features in the wood handling equipment, which prove a saving both in initial cost and operation. The circular type stacker has a storage capacity of 180,000 cords. A pulverized fuel system is used in the steam plant. The paper machines have a width of 245 inches, speed up to 1,000 lineal feet per minute, and a capacity of 110 tons of news print per 24 hours. These machines are driven by electric sectional drives. The grinders, of which there are twelve, are the hydraulic feed magazine grinders. They are installed in units of two, which are connected to 2,800 h.p. synchronous motors. The digester house contains 3 17x50 feet digesters, which empty into horizontal blow tanks.

### New Model Town

The company, in order to provide good living conditions for its employees, has developed a new town which is modern in every respect. The new town of Dolbeau has today a population of 2,600. It has over 300 houses, stores, churches, hotel, banks, and a theater; it has well lighted streets, water and sewerage system.

## Spaulding Pulp Co. Contemplates Expansion

Although the Spauling Pulp & Paper Company, Newberg, Ore., has been in operation only since the first of the year the management contemplates a program of expansion. The mill already finds itself in the unusual position for a new mill, of refusing further orders for the reason that its entire future production has been contracted for over a period in keeping with good practice. This condition may be explained by the fact that the quality of pulp produced for the past six months is such that it is highly desired by Eastern paper manufacturers. In fact, it is said the pulp compares most favorably with the highest grades of strong, clean, unbleached sulphite on the market today, suitable for the manufacture of the higher grades of paper. The Perkins-Goodwin Company are the sole sales agents in the United States.

The location of the mill is on the Williamette River and has a direct rail connection with the Souther Pacific Company which taps a huge stand of virgin timber highly desirable for the manufacture of pulp. As the Williamette River is a navigable stream, the mill enjoys water transportation which enables it to place its product on ocean-going steamers arriving and departing from the Port of Portland for world ports in addition to those located on the Atlantic Seaboard. The mild climate prevailing in the Williamette River Valley throughout the year is ideal and a distinct advantage.

Only logs and cordwood are used in the manufacture of pulp. The use of logs, generally of very large dimensions, has resulted in the installation of two steam splitters and circular saws specially designed for the purpose intended. This equipment is a radical departure from that prevalent in Eastern pulp mills. After the wood has been sawed and split, it is barked on knife barkers and thoroughly washed.

Direct electric drives have been used wherever possible thereby reducing belt drives to the minimum.

As the policy of the company from its inception has always been to produce only a high grade of pulp, an up to date sand filter plant was installed. Consequently the mill has an abundant supply of absolutely pure fresh water.

The high-pressure Stirling-tpye steam boilers equipped with special furnaces to burn hog fuel, comprise the steam plant. As an auxiliary, oil may be used for fuel. The hog fuel is delivered by conveyor from the adjacent sawmill.

The Jenssen acid system and Williamette Iron and Steel Works digesters are other units of the plant.

Diaphragm screens are used exclusively for the screening of pulp, a sufficient number having been installed to permit the use of very fine cut plates, resulting in an unusually clean pulp.

For the purpose of washing the stock, an Oliver decker is used, and the Sargent type dryers are employed in drying the shredded pulp.

In designing and building the pulp mill, particular attention was given to future expansion. Consequently the mill can be enlarged without interfering with the operation of the present unit.

The officers are: Chas. K. Spauling, president; J. C. Compton, vice-president; Lynn B. Ferguson, treasurer; Clarence Butt, secretary; S. Norman, manager.

## Mersey Paper Co. Builds Mill at Liverpool

The Mersey Paper Company is building a new two-machine news print mill at Liverpool, Nova Scotia. The Fourdriniers will be either 234 or 245 inches wide and the mill will have a capacity of 500,000 tons of news print per day. The plant will also include a ground wood mill with twelve grinders and a sulphite pulp mill with three digesters. The officers of the company are C. H. L. Jones, president and general manager, J. C. MacKeen, secretary, and K. O. Elderkin, chief engineer.

# Gulf States Paper Corp. Builds at Tuscaloosa

AFTER an exhaustive survey, the Gulf States Paper Corporation, successor to the E-Z Opener Bag Company, acquired a site covering approximately 130 acres on the Warrior River at Tuscaloosa, Ala., where it is constructing and equipping a thoroughly modern sulphate pulp and kraft paper mill with a capacity of 100 tons of finished paper per day or 30 thousand tons per annum, which with the Braithwaite plant will give the company an annual capacity of 43,500 tons. To effect economy in operation, the company will move the main office and its bag making plants from Decatur, Ill., and Orange, Texas, to the site of the new mill.

### Favorable Location

This location affords the company the benefit of water transportation via the Mississippi-Warrior Barge Line and ample railroad facilities are extended by the Louisville & Nashville, Mobile & Ohio, and Southern railways.

The supply of low cost pulpwood available within a radius of 40 miles from Tuscaloosa, the excellent transportation facilities, the low cost of fuel and favorable labor conditions were factors which largely determined the selection of this site for the new plant.

### The Various Buildings

The group of buildings shown in the illustration from right to left is first, the bag plant, which will house individual bag making machines. That building is 280 feet by 220 feet in size and three stories high. The second building from the left is the pulp and paper plant, which will house a new paper making machine. This machine was purchased from the Beloit Iron Works, Beloit, Wis., and is capable of making 1,000 feet of paper per minute, with a width of 234 inches. It has been especially designed for the Gulf States Paper Corporation and will be one of the most up to date machines in use. The pulp and paper mill building will be two stories high and 110 by 280 feet in dimensions.

Next is the beater building, 75 by 110 feet and three stories high. The next building, the one on the left, is to house the digester. It will be 70 by 90 feet in floor measurement. Other buildings not shown in the illustration, include the recovery room, which is to be 165 feet by 60 feet; the wood room which will be 50 feet by 50 feet; the power plant which will be housed in a building 120 by 110 feet; the machine shop which will be 100 by 100 feet, and the store room and plant office which will be 80 by 80 feet.

### To Start Operations About Jan 1.

The new plant will be of concrete and steel and will begin the manufacture of paper and bags shortly after January 1, 1929. The plant will produce approximately 90 million pounds of finished paper and bags per year or 300,000 pounds per day. The annual consumption of coal will amount to 270 thousand tons; for the operation of the plant 90,000 cords of wood will be consumed annually or 300 cords daily.

The general offices and the Decatur plant will be moved to Tuscaloosa, but a stock will be carried at 444 West Grand avenue, Chicago, to serve the trade in the middle west.

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## New Paper Plant for Oregon

A new $1,000,000 paper mill will be started at once in the Coos Bay District of Oregon, the southwestern part of the state. This announcement was made recently by C. McC. Johnson, prominent lumberman of Marshfield. The mill will be located at Empire, a pioneer town. It will be a 50-ton sulphite mill manufacturing bond and other high grade paper.

The site is a 40-acre tract extending along the water front for one quarter mile.

The new organization is to be known as the Sitka Spruce Pulp and Paper Company, which has financing completed. Except Mr. Johnson, no other officials have been publicly named, although Nonda Anderson, a close associate in previous business connections, is mentioned as a probable member of the new company.

About 150 men will be employed. The buildings consist of a 70-foot acid tower, a steel digester housed in a building 30 by 60 feet and 100 feet high, and two other structures probably 50 by 150 feet. It is believed a railroad spur will be built from the Southern Pacific line where it crosses Coos Bay, to the mill mill.

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## New Watervliet Machine Starts Production

KALAMAZOO, Mich., October 22, 1928.—The rebuilding of the original paper machine at the Watervliet Paper Company is completed and regular production is now under way. This unit was given its tryout over a week ago and ran smoothly. It has been speeded up to a possible maximum of 7000 feet a minute from the original 375 feet. Superintendent Clarence L. Harter now places the output at fifty tons each 24 hours for the entire mill, which is double that of years past.

J. V. Boland & Co., St. Louis, are working on the new concrete stack and report it nearly finished. It will be 150 feet high, 13½ feet in diameter at the bottom and eight feet, eight inches at the top.

# Large Unit Added to Port Huron Paper Mill

## New Fourdrinier Machine Placed In Operation Recently Will Increase Production of Plant About 50 Per Cent—Provision for Further Expansion Provided for in New Building, Which Includes Laboratory and Testing Departments

STEADILY increasing demand for the products of the Port Huron Sulphite and Paper Company made it necessary to expand the plant at Black River and a huge new paper unit was placed in operation the last of August. This paper machine will increase the production of the plant about 50 per cent and will also add fourdrinier papers to the company's line of M.G. and cylinder specialties.

The new machine is of Beloit make, 132 inches width, with 120 inches trim. It is equipped with two Bird screens, Beloit slice, and a 70 foot wire. The fourdrinier part is adjustable at the couch end. The suction couch and the suction press are operated by an Ingersoll Rand Vacuum Pump, driven by a synchronous motor. The second press has a granite top roll and the third gun metal.

The drier section is composed of two smoothing rolls, 24 driers 48 inches in diameter, eighteen in the first bank and six in the second. A size press, cooling rolls, and two calender stacks, one 6 and one 8 roll, complete the drying equipment. An Aldrich reel and two drum winder make up the balance of the machine. The driers are equipped with a Sheehan rope carrier.

The drive consists of an Elliot twin engine giving a speed range from 100 to 600 feet per minute. Spiral gear in-drives are driven from a line shaft. There is no constant speed line shaft, the auxiliaries being driven by motors. A Penberthy dryer system uses exhaust steam from the engine.

The beating equipment consists of 2,000 lb. beaters and a Mammoth Junior Precision Jordan driven by a 200 h.p. synchronous motor. The Jordan is between the machine chest and the machine. A North saveall and Cameron white water pumps take care of stock losses.

The machine is housed in a new building, 80 feet by 300 feet, and is served by three overhead cranes with electric hoists. The bleach plant capacity is being increased by the addition of another Biggs rotary bleacher and two Oliver filters, which will furnish slush stock to the beaters.

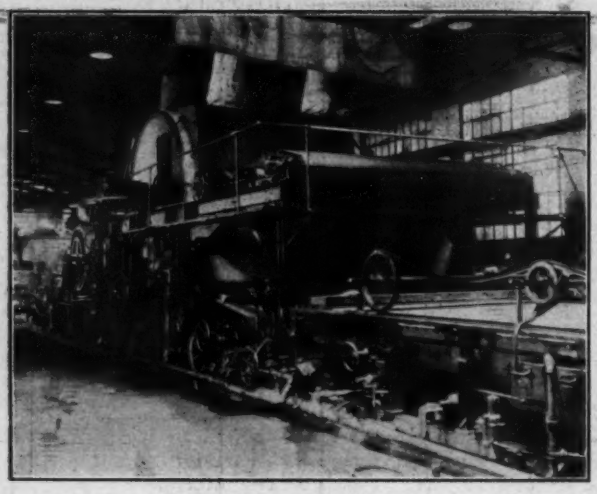
### Fully Equipped Laboratory

In designing the new building it was necessary to include facilities for laboratory and testing departments, vaults for storing the large stock of aniline dyes always carried on hand and for future expansion and development. The building was also equipped with three traveling bridge cranes to facilitate the handling of rolls and presses on the paper machine and for the rolls of paper in the finishing room. This is another point where economy of manufacture has been accomplished without sacrifice of quality. The design of the building was completed and the structure erected of dimensions which would easily be suitable for double the present requirements.

One of the main functions of the laboratory is checking up and recording tests of the finished paper. Not only are the machine tenders on each machine constantly testing for control of their operation but in addition to this a tester from the laboratory is on duty at all hours of the night and day. Tests are carried on covering all such points as basis weight, moisture content, Mullen test, Schopper test, Elmendorf test, caliper, etc.

The judgment as to the sheet of paper is not determined by any one test but is based on an average of all possible check and calculation. The function of the laboratory is to maintain these tests, check them over and record them. Careful inspection is also made of every roll as it comes from the machine for winding and uniformity and several sheets from every roll are thoroughly in-

AIRPLANE VIEW OF PLANT OF PORT HURON SULPHITE & PAPER CO.



120 INCH YANKEE MACHINE

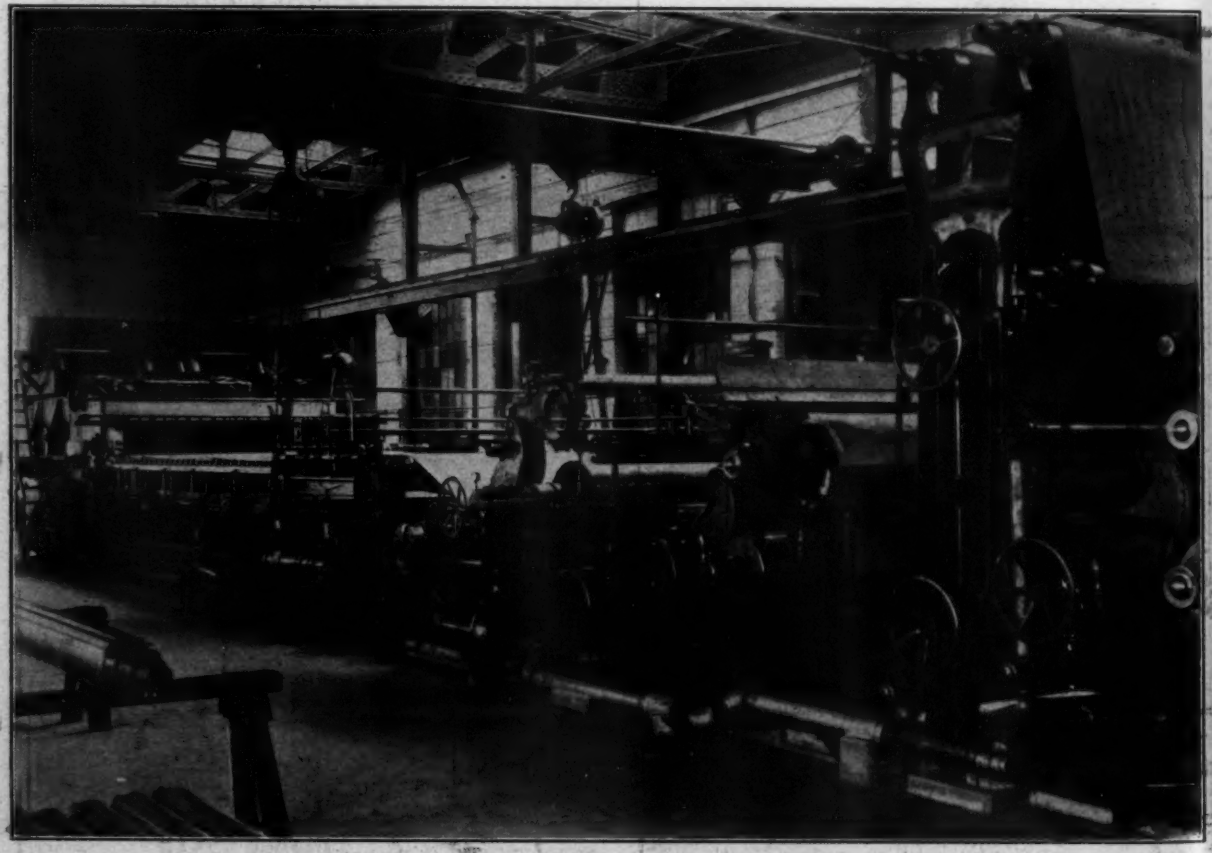
spected for cleanliness, formation, etc. While the expense of maintaining this testing department is large, still this department without question is essential in present-day manufacturing operations.

This new building was located in such a manner so that the finished product from the paper machine itself can be loaded directly into the cars with a minimum of labor. At the same time the location was such that the routing of the paper from the paper machines was carried through in such a manner so that there were no lost motions in carrying it through the finishing room and into the car. The present lay-out of the older paper machines of the company is such that a roll of paper would not have to travel over 100 feet to be deposited directly into the car.

Before proceeding with this expansion very careful analysis and study was made of the market available for the high class Mitscherlich papers they are in a position to manufacture. All possible data was collected and study was made of the proper type of equipment and design.

The company was faced with the problem where it is absolutely essential to increase production of paper but it was very important that the proper decision be made as to the type of machine. The company was already operating two machines known as the Yankee Fourdrinier which machines were manufacturing light-weight papers ranging from tissue up to heavy-weight envelope stock in what was known as the machine glazed sheet. This particular paper is of a character where a high finish appears on one side of the sheet and is particularly suited for such purposes as creping tissue, tin foil backing, bread wrapping, envelope papers, and a general line of wrapping. The range of weights of paper ran from a 10 pound tissue up to a 55 pound envelope. They were also producing on other machines a type of cylinder paper which ranged in weights from 80 pounds to 225 pounds and was suitable for such purposes as coating stock, general papers, bristol, manufacturing of heavy-weight envelopes and shipping tags.

With the equipment of Yankee Fourdrinier machines and cylinder machines it was thought advisable when choosing the new machine to install what is known as a straight fourdrinier. This choice, however, was subject to some question in view of the fact of the great success the company had had in the past on machine glazed papers and on the cylinder papers. The decision,



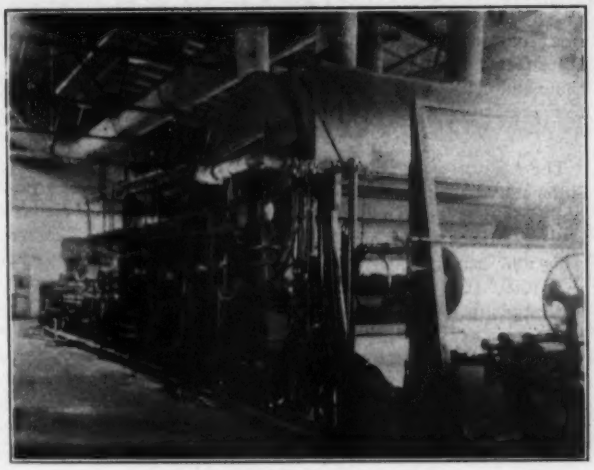
WET END OF NEW 120 INCH FOURDRINIER

however, was finally made in favor of the straight fourdrinier type as this would round out the products of the company and would then place it in position to manufacture Mitscherlich papers ranging from 10 pounds tissue weights up to 225 pound tag weights and in the three fundamental types of papers namely, machine glazed, straight fourdrinier and cylinder. This great range of papers was particularly suited for the present-day requirements of various converters and distributors and makes it possible for the company to give their customers the benefit of practically any type of paper from the one source. This point is of particular advantage in making up combination cars to fill the various demands of individual customers.

### Determining the Speed

In determining the speed for which the new machine should be designed it was necessary to consider the fact that they would desire to manufacture papers ranging from 20 pounds up to 100 pounds, which would call for a 5 to 1 speed range. The average paper machine does not exceed a 3 to 1 speed range for ordinary purposes and it was essential to secure a variable speed drive which would give uniform speeds with a 5 to 1 ratio. It was decided to design the machine to run at a moderately high speed, but the company decided against extreme high speed in favor of quality.

On this point of speed and range of the machine the Port Huron Sulphite and Paper Company again specified conditions which would be in favor of quality and uniformity rather than extreme high speed. The uniform speed control is most essential for producing uniform weights of paper on the machine. The moderately high speed, without going to the extreme possible speeds, was in favor of better formation and quality as the paper is formed on the machine. They did not endeavor to secure low manufacturing costs by extremely high speeds, but preferred to adhere to quality and effect low manufacturing costs in other ways such as economy

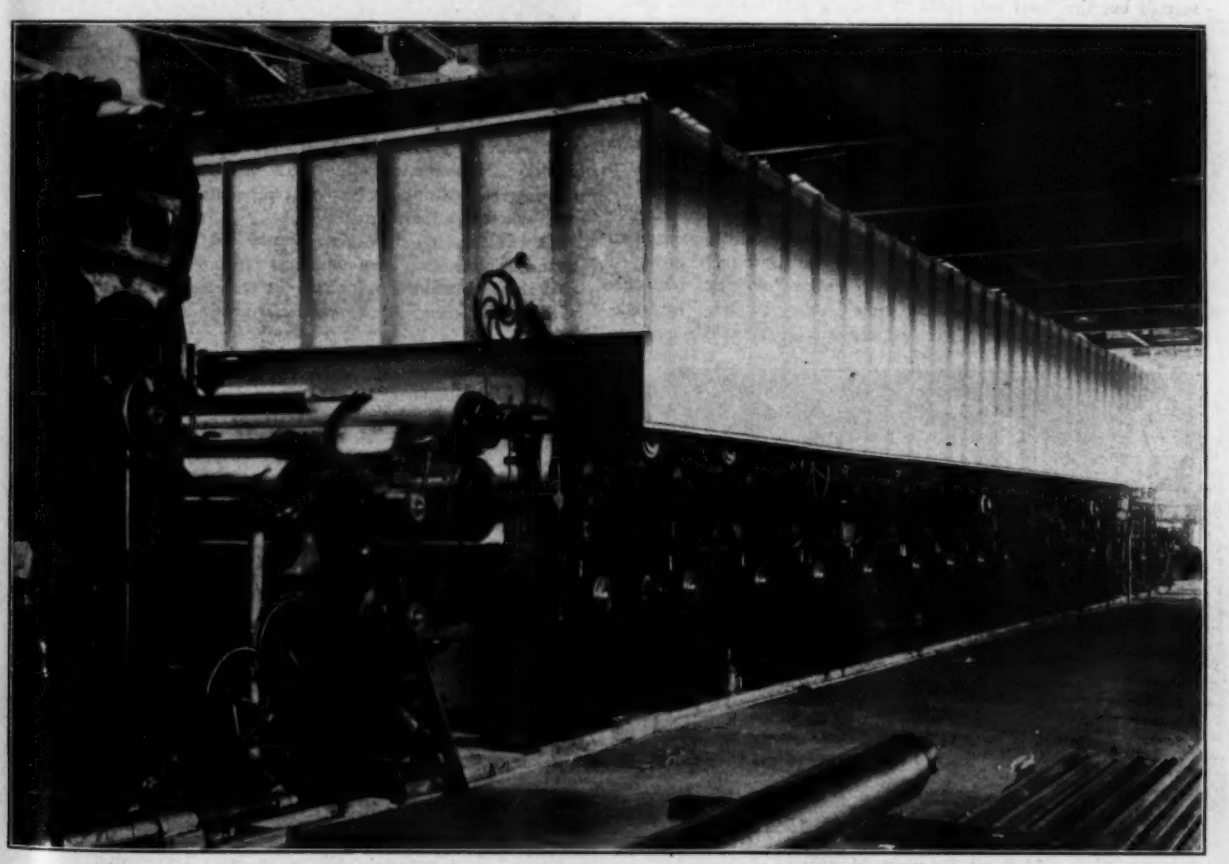


120 INCH YANKEE MACHINE

in power and design in installation. The speed of the machine was specified at a maximum of 700 feet per minute.

### Equipped with Shaking Device

The new machine is equipped with a shaking device where not only the number of strokes can be regulated but also the length of the stroke. This is a very recent development and very few machines in the country are so equipped. With this device the entire formation of the sheet can be controlled. If the requirements of a paper call for a very grainy sheet then this can be



DRY END OF NEW 120 INCH FOURDRINIER

accomplished. On the other hand, it the requirements are for a paper uniform in strength with and across the grain, the proper adjustments can be made to bring this about. On this new machine and considering the special natures of the papers which will be manufactured, this point is a valuable feature.

### Development of Company

The history of the Port Huron Sulphite and Paper Company is the story of a local manufacturing institution, founded in a small way in 1888 and growing through the years, adopting new methods, new machinery and progressive ideas of management. The company now employs 300 men, with a total annual payroll of more than $500,000. Investment in plant and equipment is $1,600,000.

A new process of making pulp and paper from wood had just been invented by the German Chemist Alexander Mitscherlich. Apparently there were unlimited possibilities in the process, as wood was very cheap and easily obtainable, and the resultant product was expected to be just as good as rag pulp, which was then very dear. In fact it could be easily demonstrated in the laboratory that on an original investment of $100,000 a quarter of a million or more per year was to be made.

And so a site of twelve acres up Black River was secured. Henry Howard picked out the choicest white pine logs and sawed them to the right dimensions and so well did he do his job that the 100 foot towers which overlook the plant are still made of the original timber from the Howard mill. The first mill was erected, just above the Grand Trunk Bridge, which was even then known as the "old iron bridge," having been fabricated in London, England, in 1849. It looked quite imposing off in the outskirts of the town.

### New Process Started

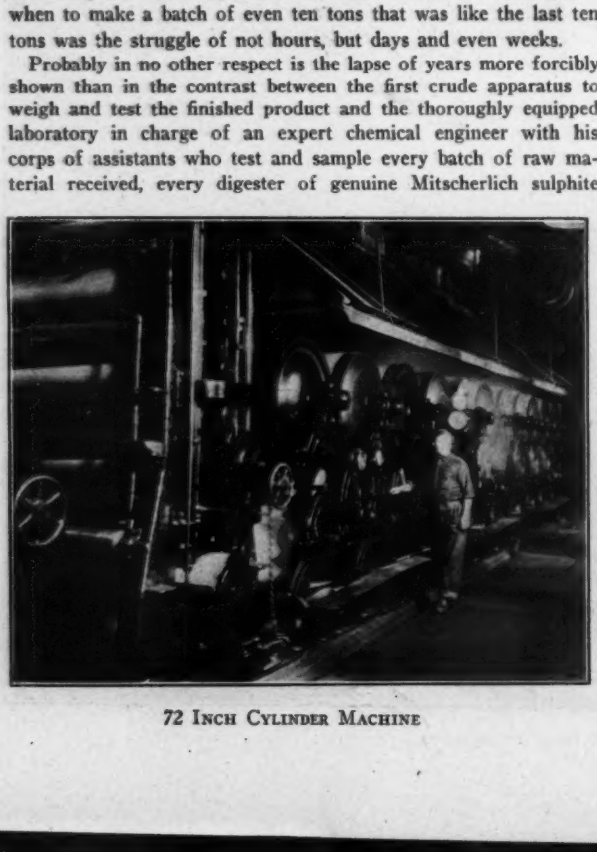
A corps of German experts came over and the new process was started but the "best laid plans of mice and men gang aft aglee" and instead of making a fortune these early pioneers had to invent practical means of working the process to a commercial success. It is a revelation to go through the smooth running mill of today and see thousands of tons of pulp turned out so uniform in color and strength that it takes the exact measurements of the chemical laboratory to detect any difference and to look back fifty years when to make a batch of even ten tons that was like the last ten tons was the struggle of not hours, but days and even weeks.

Probably in no other respect is the lapse of years more forcibly shown than in the contrast between the first crude apparatus to weigh and test the finished product and the thoroughly equipped laboratory in charge of an expert chemical engineer with his corps of assistants who test and sample every batch of raw material received, every digester of genuine Mitscherlich sulphite

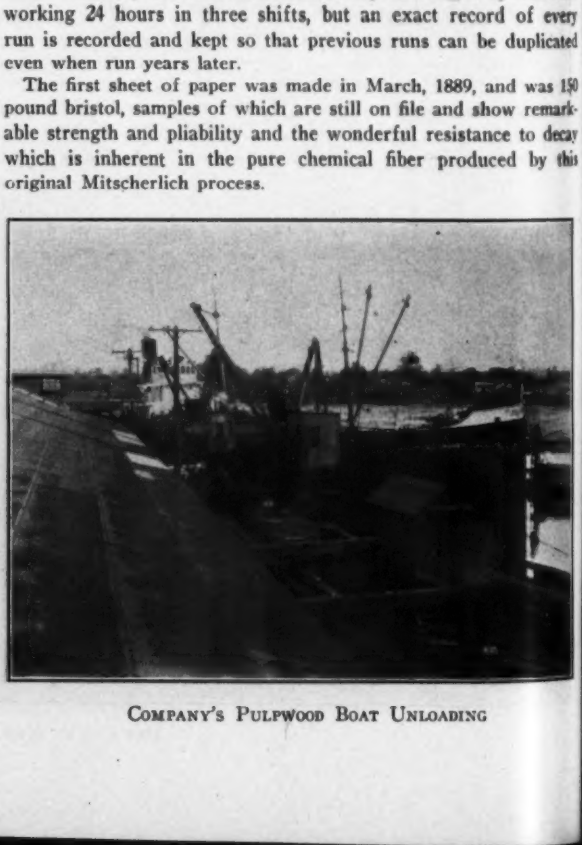
72 INCH CYLINDER MACHINE

fiber made and every roll of paper made, as it rolls endlessly and continuously day and night off the five machines in this modern mill. Not only are these tests made day and night by chemists working 24 hours in three shifts, but an exact record of every run is recorded and kept so that previous runs can be duplicated even when run years later.

The first sheet of paper was made in March, 1889, and was 150 pound bristol, samples of which are still on file and show remarkable strength and pliability and the wonderful resistance to decay which is inherent in the pure chemical fiber produced by this original Mitscherlich process.



72 INCH CYLINDER MACHINE



COMPANY'S PULPWOOD BOAT UNLOADING

Paper mills, however, were quick to see the advantages of this new fiber in comparison with the old rice and barley straw or rag pulp and the mill was put on making sulphite pulp under the energetic leadership of O. L. E. Weber, then a young engineer, who was graduated from the University of Michigan in 1893 and displaced the foreign experts who apparently had difficulty in adjusting themselves to American conditions. From that time on the mill has made steady progress, doubling its output and capital almost exactly every 10 years.

In a picture accompanying this article can be seen the company's ocean going steamer, *W. J. Crosby* unloading spruce and in the airplane view of the mill can be seen about four acres of wood all stacked eight feet high for the following winter's supply. The company has always pursued the policy of obtaining the best raw material and then taking care of it. The methodical piling of wood, row by row and tier by tier, with proper air space in between may be more costly at first, but amply repays the effort and cost by more uniformity of product and a greater chemical control of the whole process.

The manufacturing processes are carefully supervised and regulated; the chemical and mechanical tests are connected and verified by the most delicate of precision instruments, all to the end that the finest tree of nature, the northern spruce, which braves the Arctic winter of the far north, may be made to yield its ultimate best for the demands of modern civilization.

The company is located in Port Huron, Mich., because of the obvious advantages of this city for its purposes. An unequaled supply of pure water in unlimited quantities is the first requisite. This is obtained from Lake Huron. Transportation of pulpwood from the forest to the factory by water without reloading is also of prime importance, as is the central location, with favorable freight rates in all directions for both incoming and outgoing materials.

# San Juan Pulp Mfg. Co. Increases Capacity

The San Juan Pulp Manufacturing Company has just completed an extensive program of expansion to its plant at Bettingham, Wash., involving an expenditure of approximately $200,000. The Fidalgo Pulp Manufacturing Company at Anacortes, Wash., is under the same management.

### Add Two New Digesters

The San Juan mill has added since the spring of the present year, two new digesters of 12-ton capacity, an additional 800 hp. boiler, a new fuel bunker, enlarged and improved room, two new Fidalgo system improved dryers, additional screen capacity, and a new baling and wrapping systems.

These major improvements, of course, necessitated extensions to existing buildings, such as enlarged boiler house, digester house, chip storage, wood handling system, storage and revision of the acid plant.

The Fidalgo mill is a pioneer mill in the use of waste box lumber for the manufacture of pulp and the San Juan mill was closely patterned after it, using the same type of mill ends. Large saw mills immediately adjoining the mill and in the Puget Sound basin provided additional box waste and hog fuel. With the completion of the present year's program, however, some changes have been made in the raw material supply and the mill has turned from the exclusive use of box lumber to a partial use of waste slabs. These slabs are barked at the lumber mills and arrive at the San Juan plant in the form of 4-foot barked wood.

The wood is unloaded directly to chain conveyors, passed through showers, and inspected by a wood room crew that throws out bad stock and diverts it to the boiler house. Knotty sticks are cleaned up with a small circular saw.

### The Chipping Rooms

The chipping room is fitted with usual line of disc chippers, but a new installation here includes a power feed chipper designed by the Hesse-Ersted Company of Portland. This chipper has been designed especially for use on waste wood with a special view in mind of chipping the wood down to its final piece, eliminating the trouble that chippers have sometimes given in pulling the smaller pieces of wood or ends through without chipping. This room also has mechanical chip screens and a more recent installation of the Traylor Vibrator electric screen which gives a positive vibration of 3600 per minute. This screen was installed several months before the completion of the recent San Juan program.

### The Digester House

The digester house immediately adjoins the screen room and beyond as a part of the same building is the dryer room. All building construction is of the mill type.

In the dryer room it has been a case of making the most out of the space available and the feat has been so engineered that four Fidalgo system dryers are now installed where only two were installed before. The two new dryers, more compact than the two original dryers, have been installed parallel to the old units without enlarging the room. The present installation gives four dryers delivering shredded pulp at one end of a large room.

### Two New Dryers

The two new Fidalgo dryers represent improvements developed in pulp drying in the past six months. Some alterations have been made to make the machines particularly suited to shredded pulp. They have a larger capacity per unit over the old style dryers. The new units require only 70 per cent of the floor space used by the old installations, and machines of this type are now available in capacities varying from 25 to 75 tons for each wet machine.

The new type dryers have eliminated several minor objections present in the old style machines. The new machines do not necessitate weekly cleaning of coils. A new style wire apron used to carry the pulp through the dryer has reduced upkeep cost in that direction. The new machine also has four variable speeds, controlled with a Llewellyn drive. In the new installations the pulp chambers are positively sealed from the heating coil elements and the pulp kickers are also of special design to eliminate dust accumulation.

### Specially Designed Wet Machines

Two specially designed wet machines made by the Sumner Iron Works are used in connection with the new dryers. These employ a two-speed direct motor driven device that will permit pulp to be dried in sheets without shredding when it is desired to dry wrappers. These sheet wrappers are dried directly through the dryers without loss of time.

A new type pulp baler and new system of wrapping and tying the bales completes the San Juan installation.

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## Howard Smith Installs 154 Inch Machine

The main improvement by the Howard Smith Paper Mills, Ltd., during the year was the installation at its Cornwall Division at Cornwall, Ont., of a new 154-inch paper machine to trim 136 inches. This machine was made by the Dominion Engineering Works, Montreal, and is running at the present time, making book and bond papers at the rate of approximately 40 tons per day. This machine is replacing an old machine, and a new building to house it was constructed of sufficient dimensions to hold a further machine of approximately the same size.

A new boiler house of 800 hp. B & W straight tube pulverized fuel 400 lb. pressure, is under construction at the present time, and was necessitated for the installation of the new machine referred to, and also for a possible further installation of our soda pulp mill at the same Division.

A large extension of the filter plant at Cornwall is also under way at the present time.

# Canadian Paperboard Co. Starts Mill at Toronto

## New Plant Is Equipped With a Board Machine Trimming 112 Inches, One 60-foot Breaker Beater and Eight High Speed Type Continuous Beaters—A 72-Inch Beloit Pasting Machine To Make Solid Fiber Container Board Also Will Be Installed

ALTHOUGH a little construction work still remains to be completed, the new paper board plant of the Canadian Paperboard Company at Toronto, Ont., is in actual operation. The mill is located at the foot of Carlaw avenue, at the junction of Commissioner street. This is the new highway to be built along the water front and will become the main thoroughfare out of the city in the direction of Montreal. The eastern boundary of the property lies along the ship turning basin which is part of the new harbor development scheme and ships carrying a 20 foot draft can tie up at the company's wharf.

### Construction Begun in November, 1927

The construction of the buildings was begun during November, 1927. All the foundations are concrete set on piles and the buildings are sprinklered throughout.

The erection of the machinery was started by the company early in April of this year. The beater room has one 60 foot breaker beater and eight high speed type continuous beaters, operated by independent motors. There are five jordans directly connected to motors through flexible couplings. A large raw stock storage building capable of holding 1500 tons of material is equipped with two electric cranes which will convey the stock direct to the beater room.

### Board Machine Trims 112 Inches

The board machine trims 112 inches. It has seven 36-inch cylinders, four main presses, seven primary presses, seven 12-plate screens, 132—48-inch dryers, two stacks of calenders, a double fly-knife cutter and slitter, a two stand winder, and a Moore & White four drum rewinder. A five ton electric crane runs over the entire length of the machine room. There is a fully equipped machine shop and blacksmith shop in conjunction with the plant. A 72-inch Beloit pasting machine will be installed to make solid fiber container board.

Two railway sidings are on the property and freight is handled by both the Canadian Pacific and Canadian National Railways without switching charges.

### The Boiler Plant

The boiler plant contains two 612 hp. B. & W. Stirling boilers, carrying 300 pound pressure and two Illinois forced draft chain grate stokers arranged for 300 per cent rating. Preheated air is fed under the stokers at about 350 degrees F. Boiler furnace settings are arranged to burn 50 per cent coke breeze. Steam for the auxiliaries is desuperheated by Elliott Desuperheater. High pressure steam is fed to a steam turbine at 275 pound pressure. This unit will develop 1200 hp., 60 cycle, 600 volt current.

An auxiliary unit consisting of a 650 KVA Frequency Changer set operates on power bought from the Toronto Hydro Electric System, and there is also a similar set of 200 hp. capacity, which will be used on Sunday and holiday service.

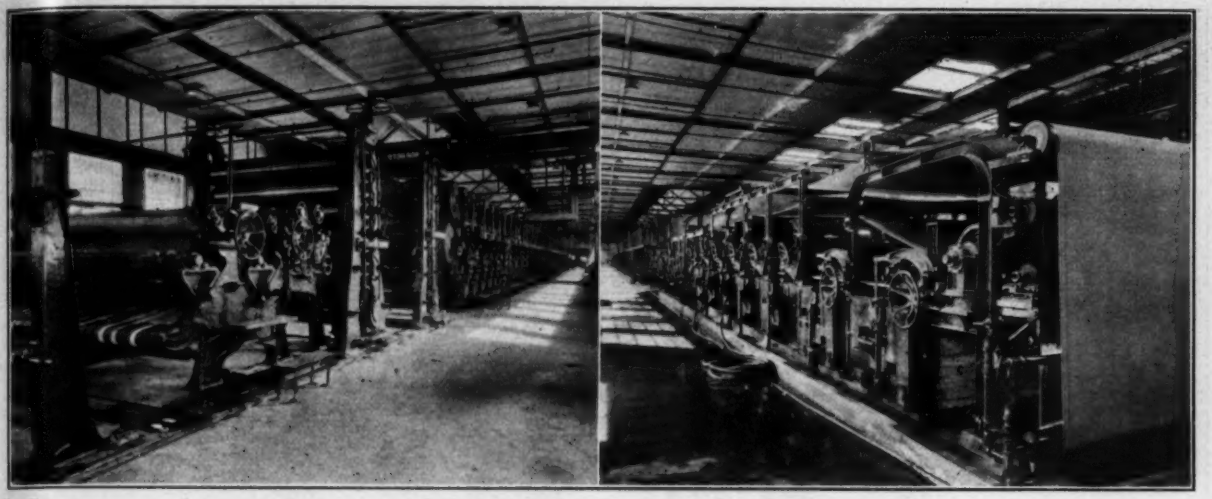
Intermediate pressure steam at 175 pounds is used in the variable speed engine driving the paper machine. This is reduced through a Twin-type hydraulically operated reducing valve.

Low pressure steam at 10 pound pressure is bled from the turbine, and with the exhaust from the variable speed engine is fed to the paper machine driers and process water heaters.

### Coal Delivered by Rail and Water

Coal can be delivered to the mill by either rail or water. It is elevated mechanically to bunkers above the boilers and weighed in transit to the stokers in a Streeter-Ammet weighing larry.

AERIAL VIEW OF NEW MILL OF CANADIAN PAPERBOARD CO., TORONTO, ONT.



NEW BOARD MACHINE OF THE CANADIAN PAPERBOARD CO., FROM DRY AND WET ENDS

Measurements and records are taken of all steam and water quantities and temperatures throughout the plant.

In addition to this new mill at Toronto, the company has three mills located at Frankford, Ont., Campbellford, Ont., and Montreal, Que. The head office of the company is at 2 Seigneurs street, Montreal.

# A. P. W. Paper Co. Makes Improvements

One of the notable programs of mill expansion during the current year is the enlargement of the A. P. W. Paper Company's mill at Albany, New York. According to Seth Wheeler, Jr., vice-president and general manager of the company, a large increase in the demand for its products, toilet tissue and crepe toweling, has far exceeded the capacity of the ten machines now in operation, and has necessitated the purchase of additional paper from outside sources.

### 178 Inch Pusey & Jones Machine

The new 178 inch Pusey & Jones machine now being erected will add approximately fifty tons to the daily output of the mill. This machine, the largest to operate on tissue and crepe, will produce any weight of paper from ten pound tissue to thirty-five pound crepe. The dry end will operate at a maximum speed of 900 feet per minute.

It is equipped with a removable Fourdrinier having twenty-one table rolls, a thirty inch Millspaugh suction couch roll and a sixty-five foot wire. The drier section consists of two banks of sixty inch drier rolls, twelve rolls in each bank. There is a single nine-roll calender stack. The machine is electrically driven in seven sections. The relative speed of the drive motors is synchronized by a General Electric system of automatic control.

A 375 kw. turbo-generator furnishes the direct current power for the drive motors. The turbine operates non-condensing. The exhaust steam is used for the process and for heating the building. Direct connected with the main drive shaft is an exciter and a booster for the voltage at the wet end of the machine.

### Turbo-Generator Set

The turbo-generator set is in a leanto off the main machine room. In this room are also three motor generator sets. One is the master M. G. set that furnishes D. C. current for the control mechanism on the main drive motors. The second M. G. set furnishes variable voltage current for the rewinders. A third generates power for various machine tools and machinery about the plant. The main control panels are also located in this room.

Adjacent to the new machine room and connecting it to the older portion of the mill is a machine shop and tool storage building, approximately seventy-two by eighty-two feet in size. The tool stock room is separated from the machine shop space by wire screen partitions and neat metal shelving provides for orderly and systematic storage of tools. Pumps for the various grades of oil used in the mill are located here with tanks in the basement below.

In the machine shop is a heavy duty lathe with a twenty-six foot bed. A new thirty-two inch by 184 inch roll grinder has also been installed. This grinder is equipped with a crowning device that will produce any degree of crown desired from 1/1000 inch to 135/1000 inch. A second smaller roll grinder and other small machine tools provide ample facilities for servicing the equipment of the big mill. Ten ton monorail hoists above the larger machines will expedite the handling of rolls.

### Pulp Storage Building

Ground wood pulp from the company's own pulp mill in Nova Scotia and sulphite pulp from Sweden are delivered direct tc the mill dock along the old Erie Canal. It is then stored in the new 50 foot by 250 foot pulp storage building, where a three ton traveling crane stacks the bales to a height of forty feet.

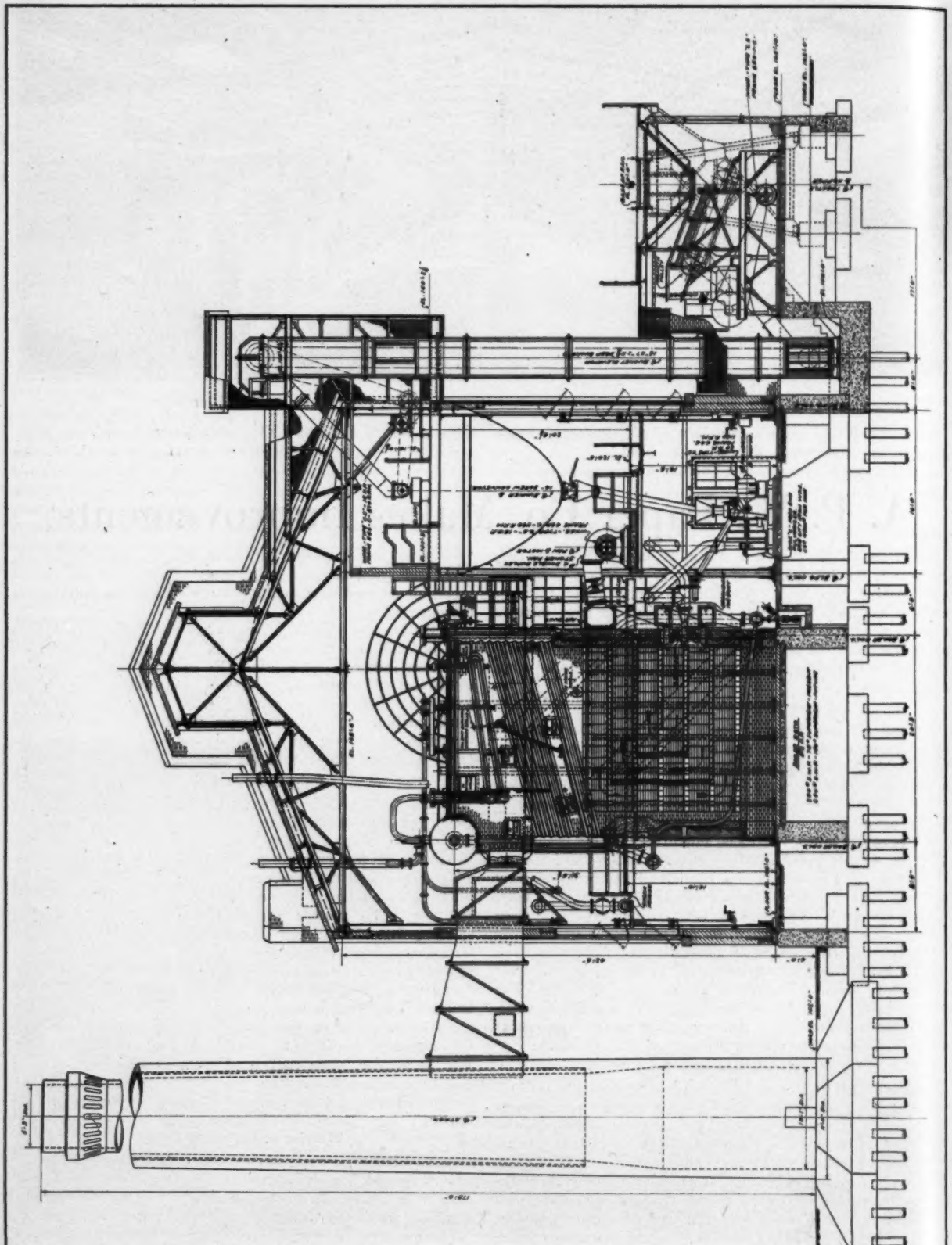
The paper machine is housed in a new building 60 feet by 250 feet long. This building is so designed that it can be widened to ninety feet when an additional machine is required, without interruption to regular production. A thirty foot extension will be spliced to each truss and the columns will be moved to their new foundations. The twenty ton traveling crane with which the building is equipped is also designed for similar extension.

All building and machine foundations are supported on piles driven to solid bearing. Delays due to misalignment will therefore be avoided. The roof is of timber construction with an inch of cork insulation. The dryer section of the machine will be hooded and a Ross system of forced ventilation will be provided.

### Warehouse Being Enlarged

In addition to this expansion of the mill, a second story is now being added to the company's Broadway warehouse to take care of the increased output of the mill. This second floor will furnish approximately 30,000 square feet of space.

The engineers of The H. K. Ferguson Company, Cleveland, Ohio, have designed and built the buildings and are installing all machinery as well as the mechanical equipment for the buildings.



CROSS SECTION OF BOILER HOUSE OF THE WAUSAU PAPER MILLS CO., WAUSAU, WIS.

# New Power Development at Wausau Paper Mills

## New Boiler House and Hydro-Electric Station Are Built in Endeavor to Solve Question of More Economical Steam and Power Provisions — Improvements Include New Water Wheel, Two 512 hp. Boilers and Latest Type of Auxiliary Equipment Throughout

THE plant of the Wausau Paper Mills Company is situated on the Wisconsin River at Brokaw, Wis., and has a nominal capacity of 130,000 lb. per 24 hours, of fiber, manila, bond and kraft papers; 50,000 lb. of ground wood, and 110,000 of sulphite fiber.

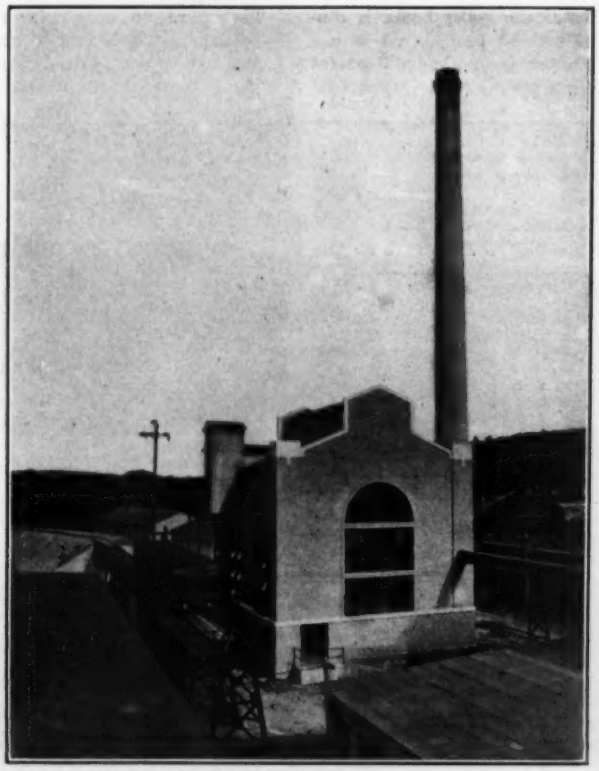
The paper mills and auxiliaries are driven in part by water wheels, in part by steam engines and in part by motors. Prior to the installation of the new boiler plant and hydro-station, direct-current generators driven by water wheels supplied light and power to a number of auxiliaries. About 500 kw. of alternating-current power was also purchased from the local utility. A 1000 kw. steam turbine was installed several years ago as a standby source of power, but has been operated only at short intervals.

The old boiler house consisted of six 150 lb. pressure, two-pass boilers of 350-400 hp. rating. Two of these boilers burned wood refuse from the mills, in combination with purchased hog fuel. The other four boilers were equipped with stokers burning coal. The steam generated in these boilers was used in part for digesters and in part to supply engines running paper machines. The exhaust from these engines at 25 lb pressure was used in paper drying rolls.

Inasmuch as some of the old boilers were of obsolete design and further in view of the relatively inferior operation of the remaining units, the question of more economical steam and power provision was taken up. A study of the entire situation was made by the Freyn engineering Company, in which several alternatives were considered.

In one arrangement the new boilers were merely to be replaced by larger and more efficient units. In another, new high-pressure boilers would be installed in combination with a turbine generator . This turbine generator would be built to supply, by bleeding, the digesters and also the mill engines, a small amount of steam passing to a condenser in order to ensure a supply to the intermittent steam uses at all times. Steam balance was such that additional electric load would be required in order that the steam input might be sufficient to meet the fluctuating demand for steam at reduced pressure for the engines and digesters.

The potential power in the Wisconsin River at Brokaw was investigated, also the efficiency at which this power was utilized. As the existing water wheels were of obsolete design, additional power development over a greater portion of the year offered attractive returns on the indicated investment.



BOILER HOUSE SHOWING COAL HANDLING FACILITIES

It was decided to install a water wheel of 1420 hp. capacity, driving a 1100-kw., 1375-kva., 3-phase, 60 cycle, 460-volt generator, at a site on the existing dam.

The generator was to supply the motors which previously took power from the utility, as well as some additional motors, replacing portions of the line shall drift from the obsolete wheels, and supplying the power required for lighting. The lighting was formerly obtained from a separate water wheel generator which is now eliminated.

It was decided to install new high-pressure boilers, designed to take care of future developments, but to operate at 150 lb. for the present. Steam from these boilers, was to be used on present digesters and paper machine engines, exhausting at 25 lb. pressure to the paper drying rolls, and to operate the

CROSS SECTION OF BOILER HOUSE OF THE WAUSAU PAPER MILLS CO., WAUSAU, WIS.

OLD DAM SITE AND NEW BUILDING HOUSING THE HYDRO-ELECTRIC STATION

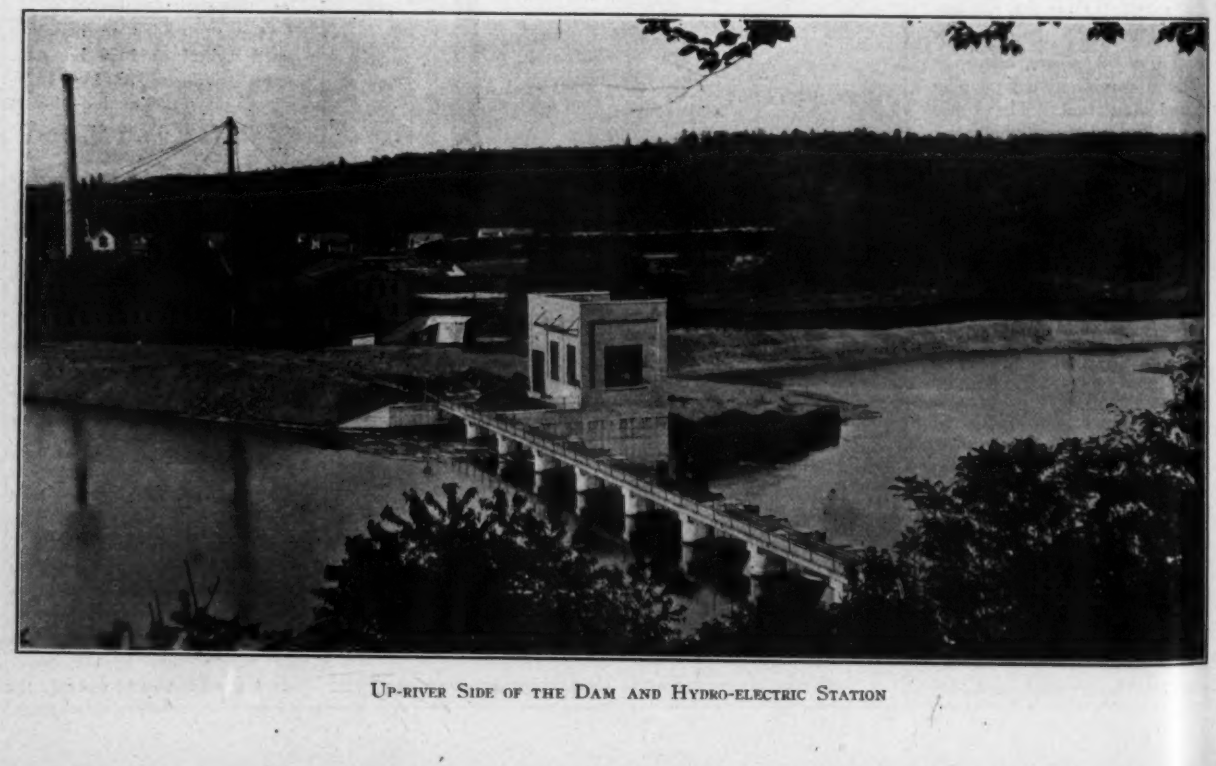
INTERIOR HYDRO-ELECTRIC STATION, SHOWING GENERATOR AND SEMI-AUTOMATIC SWITCHBOARD

existing 1000 kw. steam turbine during periods of low water, when the water wheel can not develop full capacity.

The new boiler house, which was completed in September, 1928, consists of a brick building, 47 feet 6 inches long, 51 feet wide, housing two 512-hp., water tube boilers, built for 450 lb. working pressure, 150 deg. superheat. They are equipped with water screens, air-cooled side walls, and arranged for pulverized coal firing. There are three Unitype pulverizers, each designed to deliver 4,500 lb. of coal per hour and driven by 60-hp., 220-volt motors. One pulverizer is a spare unit arranged to serve either or both boilers. Sufficient space is provided for the installation of a third boiler at a future date.

A steel trestle on the north side of the boiler house is connected to an elevated track for incoming coal. Coal is unloaded from the cars into a track hopper, from whence it passes over a belt conveyor and magnetic separator pulley to a coal crusher. This equipment is driven by a 30-hp., 220-volt motor. The crushed coal is elevated to the top of the boiler house by a bucket elevator and distributed into bins by means of a 14-in. screw conveyor, this equipment being driven by a 15-hp. motor. Coal is fed from the bins to the Unitype pulverizers by gravity. Variable speed direct-current, ¼-hp. motors are provided for the pulverizer feeders, their controllers being regulated by a combustion control system operating on steam pressure. Each boiler is provided with a No. 4 double-duplex secondary air fan driven by a 15-hp. motor. A concrete stack, 175 feet high, serves the two boilers and is arranged to accommodate the future unit.

There are no economizers or stack air heaters installed. Secondary air is heated to about 150 deg. F. through the air-cooled side walls. Coal is crushed and pulverized as received. When it is necessary to use coal at above 10 per cent moisture,



UP-RIVER SIDE OF THE DAM AND HYDRO-ELECTRIC STATION

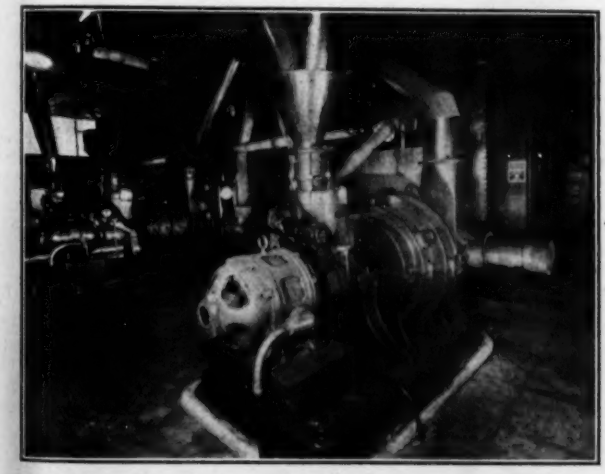
partial drying is effected by drawing some of the hot furnace gases through the primary air inlets on the pulverizers.

Furnace pressure is maintained at about 0.2-in. by automatic damper control. The combustion control system consists of a master controller governing the speed of the disc coal feeders to the pulverizers and the position of dampers in the secondary air duct between the fans and furnaces.

Manual adjustment of coal feed is made from time to time by screw control of coal feeder hopper at each pulverizer when changes in character of coal make it necessary.

Two of the old boilers have been retained in service to burn wood refuse consisting of bark and sawdust, containing approximately 50 per cent moisture. This fuel is mostly hand fed to the dutch oven furnaces and burned by cone firing. The steam output from the refuse fired boilers fluctuates due to the charging of wet fuel at regular intervals regardless of steam demands of the plant, with the result that a corresponding intermittent demand for steam exists at the new boilers. While the influence of this intermittent steam demand is seen on the steam pressure, feed water flow and, to some extent, on the waste gas temperature charts, the combustion control system aided by the instantaneous response of coal pulverizers and boilers to load changes has shown remarkable uniformity in $CO_2$ content of waste gases at all loads. Overall operating efficiencies of over 77 per cent are maintained, including week-end shut-down losses. This performance is quite satisfactory in view of the intermittent load conditions.

The new hydro-electric station is situated on the north side of the existing dam. It consists of a brick building, 28 feet wide x 48 feet long, having a 20-ton hand-operated crane installed for repair work. The water wheel is a vertical turbine



ERIE CITY PULVERIZERS ON TWO BOILERS

of Morgan Smith manufacture, and is rated at 1,420 hp., 100 r.p.m., 17.5 feet head. It is equipped with a 16,300 foot lb. Woodward oil pressure governor, located on the generator floor. This governor operates steel-plate balanced, wicket-type gates. A motor-driven oil pump pumps oil at 200 lb. pressure for the governor.

A manually-operated air brake is arranged to stop the wheel after the gates are closed. A small motor-driven air compressor supplies air pressure for operating the air brake. The main shaft bearing is of the lignum vitae type and is provided with a continuous supply of clean water furnished by a motor-driven centrifugal pump located on the generator floor. The water wheel is direct-connected to a General Electric Company, 1375-kva., 1100-kw., 100-r.p.m., 3-phase, 60-cycle, 480-volt, vertical generator, with a direct-connected 6-kw., 125-volt exciter.

This station is designed for semi-automatic operation. The machine is started and put on the line by an operator, after which no attendant is required. Protective relays are installed at all danger points, arranged to trip the generator off the line and close the gates in case of trouble. An annunciator lockout relay indicates the cause of the shutdown.

The switchboard consists of three panels, a generator panel, an exciter and voltage regulator panel and a feeder panel. Connections from the generator to the switchboard are made by means of copper bus bars, and from the feeder panel to the

ELECTRIC CONTROL FOR MOTOR-DRIVEN AUXILIARIES

main distribution board located in the mill building by means of lead-covered, varnished-cambric, three-conductor cables in a concrete duct run.

### Principal Equipment and Materials

BOILER PLANT

2—512 hp. Springfield sectional boilers, 450 lb. steam pressure—Springfield Boiler Co.
3—Size "C" Unitype pulverizers with a capacity of 4500 lb. of coal per hour each—Erie City Iron Works.
2—Convection type Foster Superheaters—Power Specialty Co.
1—2-in., 4-stage, class "SD" volute pump, 140 g.p.m. against 460 ft. head—Worthington Pump & Machine Co.
1—10 x 6 x 12-in. horizontal duplex boiler feed pump, 108 g.p.m.—Worthington Pump & Machine Co.
1—Reinforced concrete chimney, 175 ft. 0-in. x 6 ft. 3-in. i.d. at top—The Heine Chimney Company.
Forced draft fans—Buffalo Forge Company.
All motors for pulverizers, for burner fans, for coal crusher and feeder, for elevator and screw drive, for boiler feed pump, together with complete control equipment—Westinghouse Electric & Machine Co.
Automatic combustion control for boilers—A. W. Cash Company.
Soot blowers—The Vulcan Soot Cleaner Company.
Coal handling system—D. J. Murray Manufacturing Company.
Coal bunker gates and chutes—Beaumont Manufacturing Company.
Copes pump governors and feed water regulators—Northern Equipment Co.
Piping—Pittsburgh Piping and Equipment Company.
Non-return valves—Schutte & Koerting Co.
Other valves—Chapman Valve Mfg. Co.
Recording boiler feed meters—Simplex Valve and Meter Company.
$CO_2$ Recorders—The J. W. Hays Corp.
Flue gas temperature recorders—Taylor Instrument Company.
Magnetic separator pulley—Dings Magnetic Separator Company.
Erection of boiler brickwork—O. H. Warwick Company.
Fire brick and special tile for boiler settings—Chicago Fire Brick Company.
Furnace side walls—M. H. Detrick Company.
Special tile—Walsh Fire Clay Products Company.
Insulating material—Johns-Manville, Inc.
Structural steel—Worden-Allen Company.

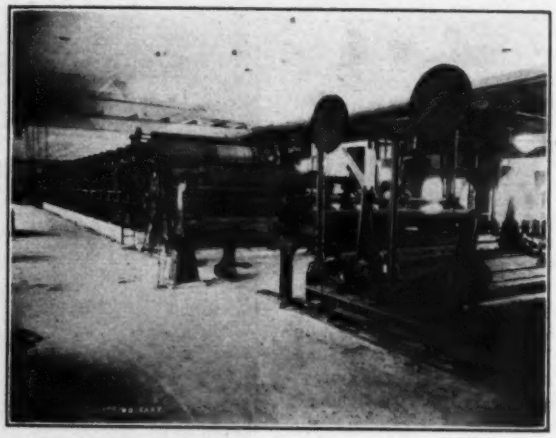
HYDRO-ELECTRIC PLANT

1—Morgan Smith 1420 hp., 100-r.p.m., 17.5 ft. head vertical hydraulic turbine.
1—General Electric Company, 1375 kva., 1100-kw., 100-r.p.m., 3-phase, 60-cycle, 460-volt, vertical generator with direct-connected, 6-kw., 125-volt exciter.
1—Woodward Governor Company, 16,300-ft., oil pressure governor and motor-driven oil pump.
1—15-cu. ft. per minute, 100-lb. per sq. in., motor-driven air compressor made by Woodward Governor Co.
Bearing water pump—Worthington Pump & Machine Co.
20-ton hand-power crane—H. D. Conkey & Company.
Switchboards—Westinghouse Electric and Manufacturing Company.
Storage battery—Electric Storage Battery Company.
Lightning arresters—General Electric Company.
Transformers—Westinghouse Electric & Manufacturing Company.
Lead covered cables—Standard Underground Cable Company.
Structural Steel—Worden-Allen Co.
Roof—U. S. Gypsum Co.

# Sylva Paperboard Co. Starts Mill at Sylva

## Utilizes Chestnut Chips, Which Were Formerly Used as Waste Fuel—These Are Cooked by the Semi-Chemical Process and the Pulp Is Refined by Four Rod Mills — Makes 130,000 Lbs. Per 24 Hours of Paper Board for Corrugating

THE Mead Paperboard Corporation has recently completed the construction of its second operating subsidiary, the Sylva Paperboard Company at Sylva, N. C. The first operating company, the Southern Extract Company at Knoxville, Tenn., which originated as an experimental mill, was expanded to a production of fifty tons per day of .009 corrugating board simultaneously with the construction of the Sylva mill.



VIEW IN MACHINE ROOM

### Chestnut Chips Used

The mill of the Sylva Paperboard Company has a capacity of sixty tons of .009 corrugating paper daily, and utilizes as a raw material leached chestnut chips and from which the tannin has been extracted for the purpose of manufacturing chestnut extract, which is utilized in the leather industry. In the past, the waste chips were thrown under the boilers for fuel.

### Developed at Madison

The Mead interests in combination with the Southern Extract Company of Knoxville, Tenn., manufacturers of chestnut extract, first commercialized this process, which was originally developed by cooperation of officials of the Forest Products Laboratory of the United States Department of Agriculture at Madison, Wis. The Sylva Paperboard Company was organized by the Mead Paperboard Corporation in conjunction with The Armour Leather Company a subsidiary of Armour & Co.

### Semi-Chemical Process

At Sylva, after the tannic acid has been leached from the chips, they are conveyed by an overhead conveyor into overhead bins from which they are dropped into four rotary digesters with a capacity of approximately seven and one-half cords each. Here they are cooked by the semi-chemical process, and the pulp is refined in four rod mills, a novelty in the pulp and paper industry. It is then pumped through jordans into a machine chest from where it passes onto a two-cylnder paper machine. The machine trims 132 inches, and has a capacity of sixty tons per day.

### Used for Corrugating

The product, which, like that of the Southern Extract Company, is utilized for corrugating, makes a very rigid corrugating container and for that reason is being consumed very rapidly by manufacturers of corrugated boxes.

## Grays Harbor Pulp Co. Ships Pulp

HOQUIAM, Wash., October 19, 1928.—The first shipment of pulp in commercial quantities left the harbor early this month, when the new Grays Harbor Pulp Company shipped four cars to Kalamazoo, Mich., for manufacture into paper.

PLANT OF THE SYLVA PAPERBOARD CO., SYLVA, N. C.

# Rhinelander Paper Co. Starts New Fourdrinier

## Is 140-Inch Beloit Machine of Very Latest Type With Removable Fourdrinier—Company Also Builds New Two Story Finishing Room, an Entirely New Boiler Room and a New Mill Office Containing Laboratory and Superintendent's Offices

THE Rhinelander Paper Company, Rhinelander, Wis., has during the past year continued its program of extensive changes and added much new equipment. These additions will place it as the second largest glassine mill in the country. In addition it is said to be the only large glassine mill which manufactures its own sulphite, a condition which enables it to control its paper "from the tree to the finished product".

The additions consist of a complete new glassine machine with all auxiliary equipment, new supercalender stacks, new finishing room, a complete new boiler room, roll grinding equipment and new mill offices.

The new glassine machine is a 140 inch Beloit of the very latest type with removable Fourdrinier. This machine is the last word in ultra modern equipment for the production of glassine and greaseproof papers. Every known improvement in glassine equipment has been incorporated in this machine.

Two new Perkins supercalender stacks, one 72 inches wide, are included in the auxiliary equipment. This 72 inch stack is among the widest in the country adapted to produce glassine. A special direct current motor drive was developed to handle these stacks and will give unusually smooth operation which in turn will be reflected in the finish of the sheet.

A two-story new finishing room of 8,000 square feet area on each floor was erected for handling sheets only. This building is of brick, steel and concrete with large window areas to enable careful daylight inspection of all work. For inspection by lamplight special daylight lamps are installed.

The interior of the building is completely finished in white enamel. It is interesting to note that in this department particular attention is given to proper control of the humidity of the air to keep the glassine sheet in the best possible condition.

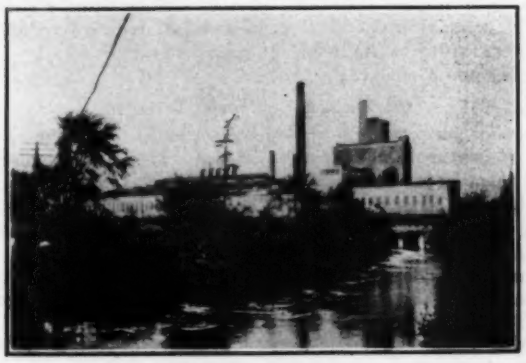
The expansion along the lines indicated called for more power to operate the new equipment, so an entirely new boiler room was erected.

Babcock & Wilcox Stirling boilers were installed to be fired by Taylor stokers. Furnaces are equipped with water walls to reduce maintenance and enable long periods of operation without shutdown.

Foster-Wheeler economizers of the unit type, and Babcock & Wilcox superheaters are installed with each boiler.

A complete equipment of boiler operating instruments, consisting of Bailey boiler meter, temperature recorders, steam flow meters, etc., is installed to enable the operator to work to the highest efficiency.

An overhead bunker system for coal with weighing equipment will give a daily check on fuel.



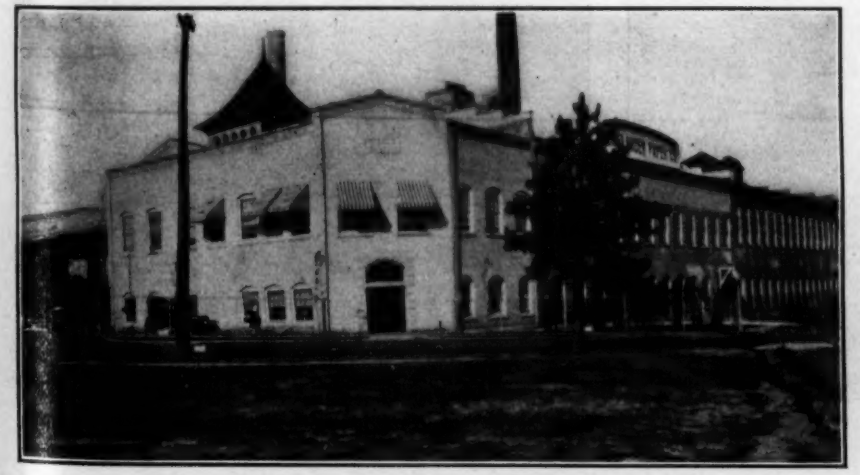
RHINELANDER PLANT

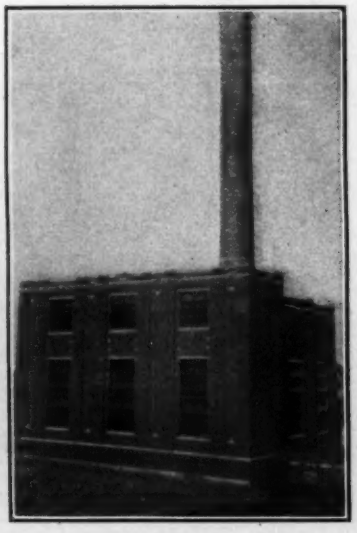
In connection with the new boiler plant a 4,000 K.W. high pressure steam turbine is being installed.

Along with other changes it was felt a more centralized mill control would prove of advantage, so a new mill office was erected. This building houses the laboratory, clock house and rest room, sulphite superintendent office, general superintendent office, employment department and engineering department.

The general layout of all paper mill equipment was under the direction of Folke Becker. The boiler room and all engineering work was handled directly by the newly organized engineering department under G. Suhs, formerly with Nekcosa-Edwards Paper Company.

AT THE LEFT, IMPROVED PART OF PLANT; AT RIGHT, THE NEW POWER PLANT





# Modern Boiler Plant Installed At Otis Mill

## New Building Equipped With Four Water Tube Boilers and Pulverized Fuel Equipment—Each Boiler Equipped With Plate Type Air Pre-Heater—Power Now Assured at Very Low Cost—Lighting and Ventilation Features Perfectly Worked Out

FUEL cost per ton of paper has been reduced to almost one-half at the Otis mill of the International Paper Company at Chisholm, Me., since the installation of the new boiler house.

Up to the time the new boiler house was put into service, the steam was generated in a boiler plant that had grown or expanded until no further additions could be made.

The equipment consisted of sixteen water tube boilers that had about reached their limit of use, ranging from sixteen to thirty years of service. The sizes varied from 225 to 520 hp. builder's rating. The original method of firing was by hand, burning run of mine coal.

### Oil Burning Equipment Installed

Several years ago oil burning equipment was installed. Burning oil increased the efficiency over coal. The result in efficiency was about 70 per cent to 72 per cent, which was low, but was due to the small combustion chamber and low setting. Eventually, the cost of fuel oil advanced sharply, so that coal as fuel was reconsidered.

On account of the age of the boilers, small size and cost of rehabilitating the plant, a study showed that with a new plant, equipped with modern high pressure boilers, and pulverized fuel burning equipment, steam could be produced burning coal as fuel at a very low cost and the plant would pay for itself within a few years.

The high pressure steam would be passed through a turbine direct connected to an electric generator, exhausting at a lower pressure and temperature, which would be capable of operating the paper mill engines as well as supply necessary steam for process work. The electric current to be generated would be an asset.

### Uncertainty of River Flow

The supply of electrical energy was entirely dependent on the flowage of the Androscoggin River. The uncertainty of the river flow made it necessary to purchase 5,000 to 9,000 tons of ground wood each year. With the installation of the turbo-generator set, power would be assured at a very low cost making it unnecessary to purchase ground wood.

### Conditions Carefully Studied

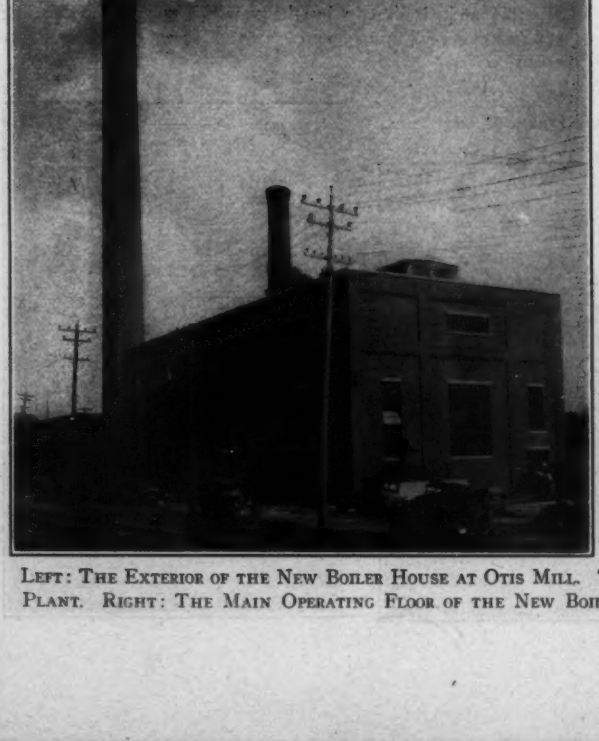
After careful though and study of conditions, the engineers designed a boiler house which was to be built on the lawn adjoining the mill office. Excavation was started in the late fall of 1926 and work kept going on all winter. In the spring of 1927, building had advanced so that the equipment was in process of installation.

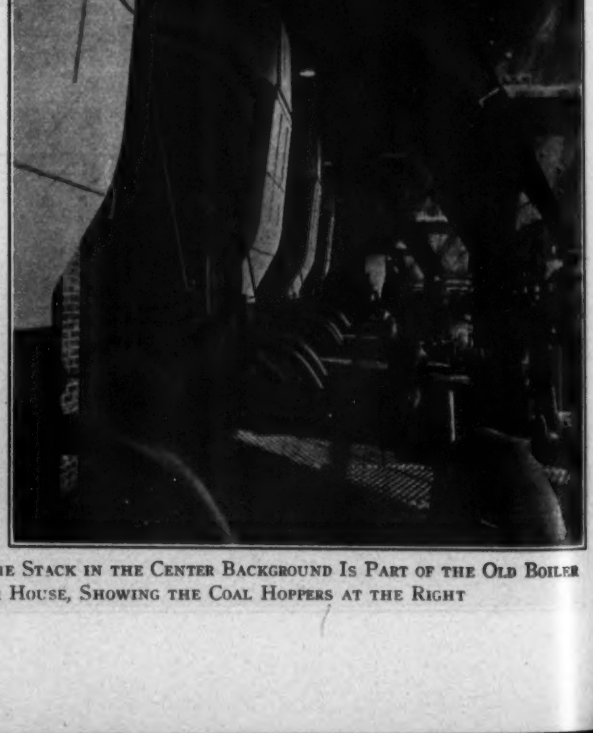
In August, 1927, the first boiler was in service, and others were added, so that early in December the new boiler plant was carrying full load with the new turbo-generator working nicely.

### Description of Equipment

Following is a description of equipment:..Four water tube boilers—1,020 each, builder's rated horsepower; Three Drums—2 upper and I lower; Steam Pressure—415 lbs.; Superheat—150°; Bent Tubes—3¼" O. D.; Furnaces: Water cooled side and bridge walls; water screen bottom; front wall solid fire brick.

The water cooled side and bridge or rear walls consist of finned tubes set on 7" centers. The fins are ¼" thick, 1½"





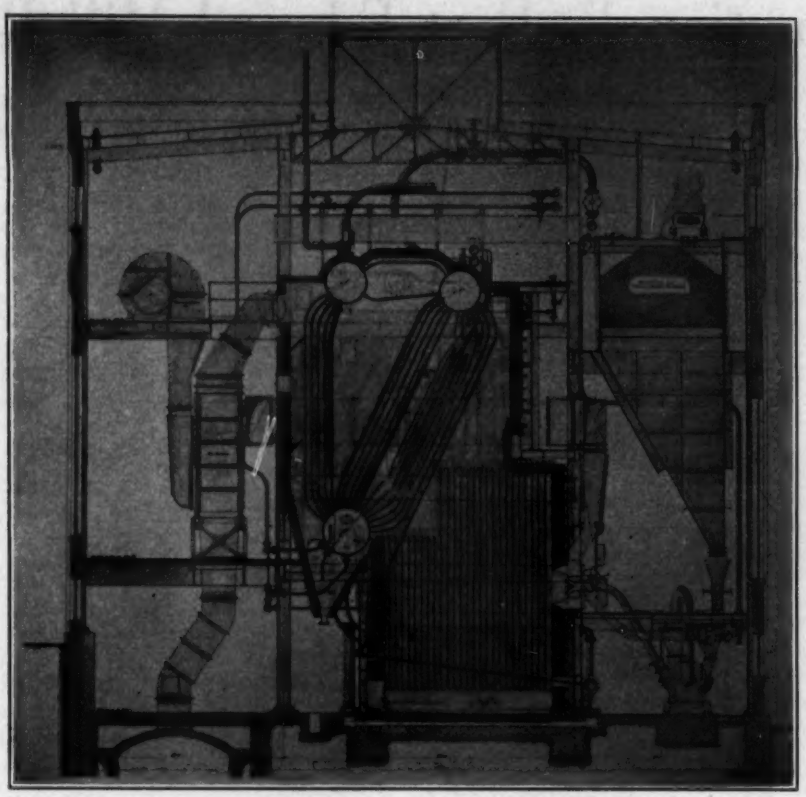
LEFT: THE EXTERIOR OF THE NEW BOILER HOUSE AT OTIS MILL. THE STACK IN THE CENTER BACKGROUND IS PART OF THE OLD BOILER PLANT. RIGHT: THE MAIN OPERATING FLOOR OF THE NEW BOILER HOUSE, SHOWING THE COAL HOPPERS AT THE RIGHT

wide, welded to opposite sides of the tubes, the function being to reduce the furnace temperature as well as increase the steam capacity of the boiler. These fin tubes are extended into upper and lower headers, which in turn are connected to the boiler drums.

### Pulverized Coal Used

Pulverized coal is used to fire the boilers. The coal is dumped from cars into a hopper, then passed through a crusher on to a belt conveyor delivering to an inside storage shed; capacity 6,000 tons. Here it is stored by means of a bridge crane.

As wanted, the coal is delivered to a hopper feeding an inclined belt, carried over an automatic scale to the boiler house bunkers; thence through feeders to the unit pulverizers, thence to the burners. All above is automatic, requiring very little manual labor.



CROSS SECTION OF NEW OTIS BOILER HOUSE

Each boiler is equipped with two unit mills, capacity 4,500 lbs. of pulverized coal per hour each. There are two horizontal type burners per boiler, in which the coal and preheated air is mixed and burned with a flame similar to oil.

### Air for Combustion

Each boiler is equipped with a plate type air pre-heater. The air for combustion is forced through the pre-heaters by individual forced draft fans, part of the air is distributed to the pulverizers at 300° F. for drying the powdered coal, and the balance to the burner nozzles at 390° F.

After combustion, the gases leaving the boiler pass down through the air pre-heaters to an underground flue that runs full length of the boiler house and through two induced draft fans which in turn discharge into a new 200 foot concrete stack. Each fan has a capacity to run two boilers at 300 per cent rating, i. e., 3,060 developed hp.

Very little ash accumulates in the furnace, and when a boiler is shut down after three or four week's operation, the ash, which is granular, or similar to sand, is removed, conveyed to a bucket elevator at one end of building, discharged into a truck and hauled away.

### Boilers Fed by Centrifugal Pumps

Two centrifugal pumps feed the boilers, direct connected to two steam turbines exhausting into the feed water heater; capacity of each pump 500 G. P. M. One pump carries the load. The feed water is pumped from a hot well, to an open feed water heater in which tri-sodium phosphate is introduced, to prevent scale forming in boiler tubes.

The chemical reaction in this water when subjected to the high heat, forms a muddy precipitate that is removed from the boilers by a deconcentrating system which keeps the water in the boilers continuously circulating through a filter element that is flushed clean at eight-hour intervals. Automatic feed water regulators are installed on each boiler.

Steam is taken from rear drums through superheater to main steam heads, thence to 3,000 KW turbo-generator, at 400 lb. pressure, 150° superheat, exhausting into mill mains at 125 lb. pressure, 68° superheat. The turbine generator is used for that portion of the mill load that the hydro-electric plants are unable to furnish.

The electric output of the turbo-generator varies as the demand of electric power in the mill, causing the quantity of steam passing through the turbine to vary, and to make up this difference, when the load falls off or the process steam demand suddenly increases, there is a pressure reducing by-pass valve and desuperheater, wherein the 400 lb. steam can pass directly into the 125 lb. line without going through the turbine.

### Lighting and Ventilating

In addition to the many fine mechanical features of this plant, the lighting and ventilating have been worked out to a nicety. The numerous large windows and monitor roof with ventilating sash supply an abundance of light and air.

The section above the coal bunkers and in rear of the boilers in the basement where the ashes are handled, are completly insulated by concrete partitions, which practically eliminate the dust question. The smoke nuisance, which was always a problem in the old plant has also been done away with.

Should a change in price warrant the burning of fuel oil, the boilers could be fired by oil by merely changing the burners and installing the necessary pupmps and piping. The ratings and efficiencies under such conditions would be equally as high as those when operating on puplverized fuel. The boilers and equipment are designed to run normally at 200 per cent and at a maximum of 300 per cent ofrati ng.

Three boilers carried the winter steam load of the mill, and on one occasion demonstrated their capacity when a faulty superheater tube suddenly threw the load on to two boilers. By increasing the rating, the load was carried until the spare boiler could be fired and put on the line. The fact that with this type of fuel boiler can be started cold and be brought up to 200 per cent rating in less than 45 minutes, adds greatly to the flexibility of the plant.

# International's Fort Edward Mill Rebuilt

## Former News Print Plant Reconstructed and Equipped to Manufacture Higher Grades, Including Special Bleached Papers—New Installation Consists of Six Paper Machines, with Capacity of 130 Tons of Paper Per Day—Many New Features

WORK was started in the spring of 1927 on rebuilding the Fort Edward mill of the International Paper Company so as to equip the plant to manufacture special bleached papers such as are made in the Niagara Falls mill of the company, and many others. This mill is now able to diversify its products to a greater extent than can be done in any other plant of the company.

The first machine was turned over and a trial run of stock was put over a machine on Thanksgiving Day last year. The new installation consists of six paper machines with a capacity of 130 tons of paper per day. This is another case of converting a news print mill to make higher grades of papers.

### Fort Edward Paper Making Center

Fort Edward is located in New York State, a few miles below Glens Falls on the Hudson River and has for many years been a center of paper making activity, starting with a mill to make paper from straw. Some of the old buildings are still standing at the lower end of the property.

In the early nineties the Glens Falls Paper Company built a ground wood and paper mill with four machines operating. Several years later a sulphite mill and two more machines were added. A little while after this, paper mill "B" was built and two machines were installed, one of which was for the manufacture of wrapper and board. This machine has been recently re-conditioned and paper mill "B" is now in operation making wrappers and cores.

As the mill is located on the feeder terminal of the New York State Barge Canal, shipments may be made by water. The principal raw materials to be used consist of waste paper and bleached sulphite, the mill being well located to convenient markets for procuring waste paper and for shipment of the finished product.

The plans for changing over this mill were under consideration by the manufacturing department for several years, and the final decision for rebuilding the mill was made in November, 1926. Actual construction started in March, 1927.

Practically all the buildings and equipment have been overhauled and a good deal more added in order to make the grades desired; the chief of these being a new boiler-house, hydro-electric plant, additional finishing room with super-calenders, a new beater room and equipment to disintegrate, de-ink and bleach waste paper, when it is used.

The paper machines have been entirely overhauled. The three machine rooms have been extensively rebuilt. The roofs over two of them have been replaced by new steel trusses with greater clearance. These roofs are covered with gunite and cork insulation. At the dry end of each room a new basement has been constructed to take care of the turbines driving the paper machines, and to furnish a runway for broke carts; the broke being taken to pulpers in the beater room basement.

The machine rooms are separated from the finishing room by a continuous gunite partition with vertical sliding fire doors opposite each machine. A new roll grinder has been installed between Nos. 2 and 3 machine rooms.

### Several Beaters Added

Several beaters have been added to the old beater room and a new beater room has been built to give the necessary extra space for the number of beaters required to take care of any ratio of book and bond papers that may be desired.

It is interesting to note that the old sulphite digesters are to be utilized for de-inking the waste paper used in the manufacture of grades involving the use of secondary stock. Large storage space for storing waste paper has been provided in the

AT LEFT INTERIOR AND AT RIGHT EXTERIOR OF NEW BOILER HOUSE AT FORT EDWARD MILL

ware-house adjoining sorting room, where waste paper is carefully sorted, disintegrated, and has the necessary amount of water added.

This mixture is then pumped to a storage tank and from there to the digesters, where it is de-inked by means of heat and a caustic solution. This pulp is then pumped into some of the old blow pits and from here it is run over screens. After this it is thickened and bleached, being then pumped to storage where it is ready for beaters.

Paper rejected in the sorting room is beaten up and pumped to paper mill "B" for use as wrapper and core stock. Sulphite and soda pulps are received in bales of dry sheets and are shredded before being supplied to beaters.

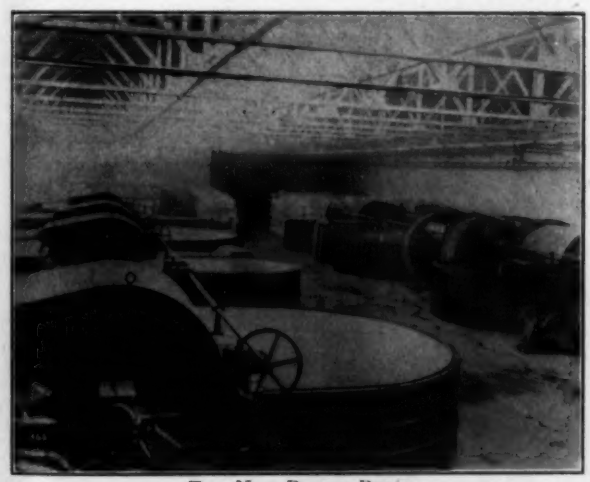
A storehouse alongside the railroad track is used to prepare alum, clay, size and bleach liquor, which is distributed by pipes to the parts of the mill where it is to be used.

### Finishing Room Enlarged

The finishing room has been enlarged and equipped with supercalenders. The second floor is supplied with cutters to take care of sheet orders. Four modern electrically operated elevators have been installed to handle waste paper and the finished product from the machines.

A new gravity and filter plant has been installed in the former location of the grinder room. From this filter the water is pumped to the mill by direct-connected motor-driven pumps. With such a well-constructed and modern filter plant, the mill is always assured of a plentful supply of clear, clean water which is so essential in making high grade papers.

Located over some of the old grinder room wheel-pits, the new hydro-electric plant contains two generating units, with space provided for a third. These consist of vertical propeller type water-wheels having each a capacity of 1300 horsepower under eighteen foot head, and are direct-connected to 1155 K.V.A.



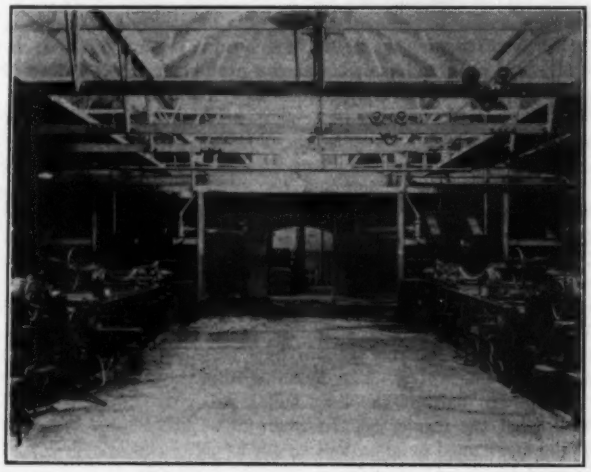
THE NEW BEATER ROOM

umbrella type generators. The current is generated at 60 cycles and 13,800 volts, and is conducted through a cable tunnel to a six panel Westinghouse switchboard equipped with solinoid operated oil circuit breakers.

A Feeder to the present substation allows the generators to be paralleled with the transmission line from the Feeder Dam plant of the New York Power and Light Corporation. A 2500 K.W. mixed pressure turbine in the new boiler house supplies 550 volt current which is tied into the substation with a 5—600,000 C.M. triple conductor cables in parallel.

With the exception of the brick stack and the north wall which was built higher and was used as the north wall of the new boiler room, the old boiler house has been completely razed. This plant with its monitor type roof is well lighted by large steel sash windows. It houses four 520 horsepower cross drum boilers which operate at 415 lb. pressure and 200° superheat, and a 2,500 k.w. turbo-generator.

These boilers are all equipped with motor-driven chain grate stokers in a front and rear arch type furnace to handle anthracite coal. The stoker hoppers are served by a two-ton floor-operated weigh larry loading from a new 150 ton steel discharge bucket conveyor from a track hopper. Additional coal storage of about 3,000 tons is obtained by using an existing concrete silo which is connected to the track hopper and new coal tank by conveyors.



WET END OF NO. 2 MACHINE ROOM

The ashes dump from the rear of the stokers into a cast iron lined sluiceway, set below the floor, and are washed along to an outside settling pit from which they are piled for storage or loaded directly into railroad cars by a locomotive crane.

All condensate throughout the mill is returned to a hot well and from this is pumped into a 1600 gallon open feed water heater which supplies a turbine driven five stage centrifugal boiler feed pump.

### Duct System Installed

The necessary forced and induced draft fans of ample capacity have been provided. The necessary duct system for handling pre-heated air and for carrying off the gases from the boilers is installed, utilizing the existing 180 inch brick stack.

All process steam is passed through a 2500 K.W. turbo-generator unit of two stage impulse type, bleeding at 125 lbs. and exhausting at 30 lbs. back pressure. The 125 lbs. bled steam is used to supply six new turbines for driving the paper machines, the exhause of these turbines being used in the dryers on the machines for drying the paper. The 30 lb. main turbine exhaust supplies steam for the de-inking process and mill heating.

With the exception of the turbines driving the paper machines, the entire mill is electrically driven. Power factor correction is obtained by using synchronous motors on the Jordans and water supply pumps.

A complete new lighting installation has been provided throughout the mill. Particular attention has been given to supply color-matching illumination for the finishing room nitrogen filled lamps being used.

Most of the new roofs are of gunite. Cork insulation has been added over rooms subject to moisture. Nearly all the stock chests are of concrete and have been given a hard finish on the inside and rubbed smooth.

The main building walls are of brick. The exterior of the old walls will be sand blasted so as to match up with the new ones. The mill itself is on a large plot of ground, and its general appearance is attractive.

# New Whiting Paper Mill Enters Production

## Old Lyman Plant, Acquired Last November, Reinforced and Equipped With Twin Paper Machines Made by Rice, Barton & Fales, of Worcester — Expansion Will Increase Range and Volume of Lines of Fine Writing Papers Made by Company

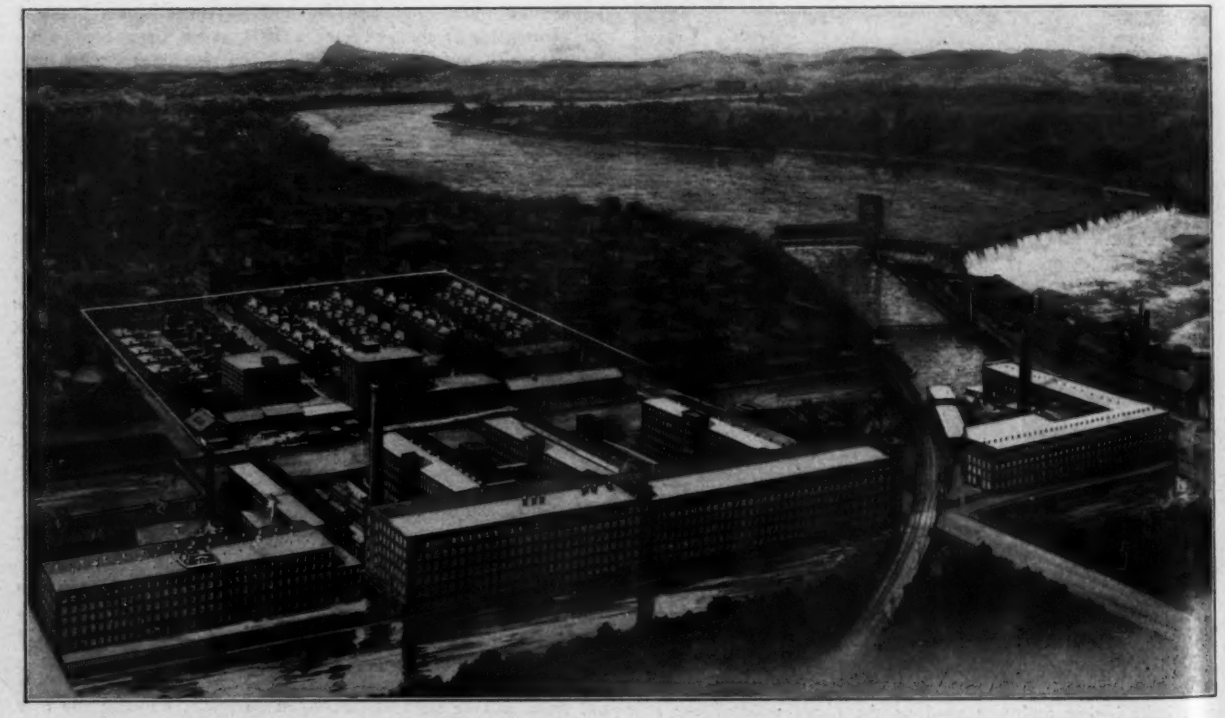
RECONDITIONED and equipped with new machinery for paper making, the Whiting Mill No. 3, composed of buildings purchased from the Lyman mills, began operation in Holyoke a few weeks ago. A new line of paper is being introduced, supplementing the lines of fine writing paper familiar to the trade, and it is understood that the new plant will be devoted entirely to this part of the production. This new addition is considered an event of distinct interest to the paper industry, for while logical accompaniment to the older lines, it is said to mark a departure from the company's established procedure.

This new step in manufacturing operations was preceded by months of work in rebuilding and remodeling property acquired by the company last November. The old Lyman mill No. 3 has been reinforced from top to bottom with structural steel and the two lower stories have been made into one huge room to house twin paper making machines made by Rice, Barton & Fales, of Worcester, and the largest in use by the Whiting mills. The two upper stories of this building have been equipped with special processing machinery. The building is directly connected with the southern half of the long building fronting on the second level canal, the former No. 5 Lyman mill. All of the five stories of the last-named building will be put in use. The first floor will be used for the shipping department, the second floor will be used as the beater room and the third floor as the rag room. The two upper stories will be used for storage. These buildings, with two stock houses, a boiler house and turbine room which are being put to use in this connection, are said to comprise practically half of the entire industrial floor space acquired from the textile corporation. Plans are in development to put the remaining floor space in use in the near future.

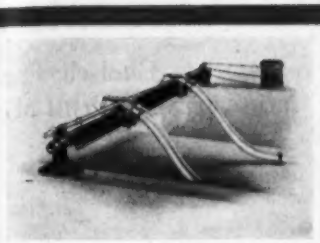
The best thing about the new departure, from a community standpoint, is that it involves no curtailment of production in the older mills of the company. Nos. 1 and 2 mills will continue to operate as heretofore without change, while the new mill enters on production of a new line for which a large demand is said to exist. Much 100 per cent rag paper is made in the Whiting mills, and all of it has some rag content. The new line, like most of the paper already produced in these mills, will carry a high percentage of rag.

The Lyman mills property combines with the old Whiting mills to form a compact group strategically located in the heart of the city. When the purchasers acquired the Lyman mills they also took over about 1300 horsepower of indentured permanent waterpower and in addition some 300 or 400 hp. of indentured surplus waterpower.

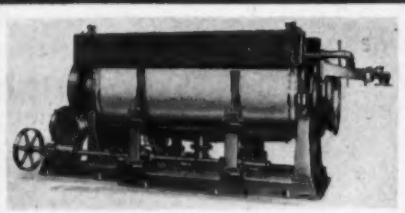
William F. Whiting, United States Secretary of Commerce, who succeeded the late William Whiting as president of the Whiting Paper company, has retired from active part in the affairs of the company, and his eldest son, William Whiting, 2nd has been elected president. The new chief executive is a graduate of Amherst College in the class of 1915, and is 35 years old. For several years he has held the office of treasurer, in which post he is succeeded by the second son, Edward Chapin Whiting. The third son, Fairfield Whiting, is secretary of the company, and will devote himself especially to manufacturing supervision. All three brothers have had the benefit of years of practical experience.



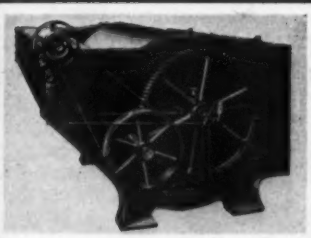
LEFT TO RIGHT: WHITING MILL NO. 2; MILL NO. 3; BOSTON & MAINE RAILROAD TRACKS; MILL NO. 1; HOLYOKE DAM. IN THE REAR ARE STOCKHOUSES AND OTHER PROPERTY ACQUIRED FROM LYMAN MILLS



THE VICKERY FELT CONDITIONER
Eliminates shut downs for felt washings. Of 484 sold, 312 represent repeat orders.



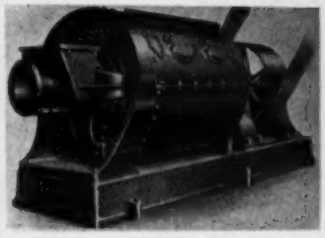
THE BIRD SCREEN
Twenty odd thousand tons of paper pass through Bird Screens daily.



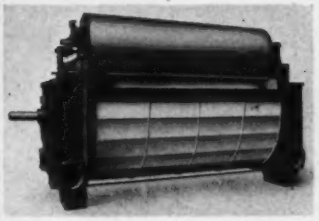
THE BIRD SAVE—ALL
High efficiency; lowest cost per pound of fibre recovered.

# BIRD MACHINERY

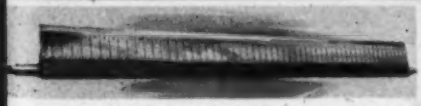
Ask us to show you exactly what each or all of these items of Bird Machinery can do to increase production, improve and maintain quality and reduce operating cost in your mill.



THE BIRD PULP SCREEN
Great capacity, remarkable savings in power, floor space, and maintenance.

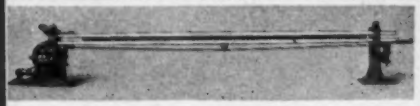


THE BIRD THICKENER
Not an ordinary decker. A real stock thickening machine.



THE VICKERY DOCTOR
For keeping EVERY roll always clean.

THE PULMAX DRIVE
Saves power, belting, floor space and maintenance.



THE ALEXANDER-YOUNGCHILD WIRE CLEANER
Eliminates shut downs for scrubbing machine wires.

# BIRD MACHINE COMPANY

South Walpole : : Massachusetts

# Paugan Falls Power Plant Begins Operations

## International Paper Co. Now Operating Three Hydro-Electric Developments, Chelsea, Farmers and Paugan, on Gatineau River—Part of Power Goes to New Gatineau News Print Mill of Canadian International Paper Co., a Short Distance Away

ONE of the largest hydro-electric power plants on the North American Continent began operation on Monday, October 1, when the Paugan, Quebec, station of Gatineau Power Company, a subsidiary of International Paper Company, commenced delivery of 80,000 hp. of electric energy to the Hydro-Electric Power Commission of Ontario. The power is sent over a 220,000 volt transmission line 260 miles long, and is distributed by the Commission in the Toronto area to supplement the power now supplied from Niagara Falls.

### Initial Installation

The opening of the Paugan plant with an initial installation of 204,000 hp. marks the completion of the first stage in the development of the power resources of the Gatineau River by Gatineau Power Company. Two other power houses on the river with a capacity of 232,000 hp. installed and in process of installation, have been in operation a year, making a total of 436,000 hp. in the three plants. Above the three plants the company has built a storage dam creating one of the largest artificial storage reservoirs in the world. It is believed that this is the first time in history that the water powers of as large a river have been developed on such a scale in such a short length of itme.

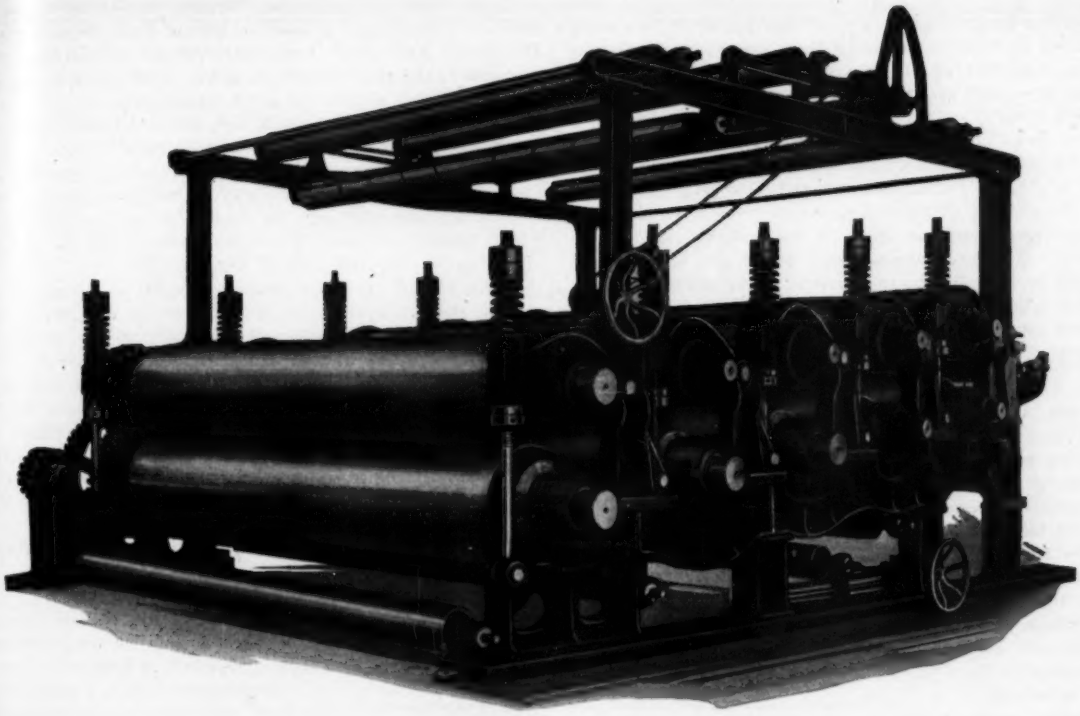
Located on the Gatineau River, thirty-five miles north of the City of Ottawa, the capital of Canada, the Paugan plant is designed for 272,000 hp. in eight generators of 34,000 hp. each, of which six are installed and in operation at the present time. The power house is 484 feet long, 110 feet wide, and 120 high.

### Nine Falls and Rapids Submerged

The dam at Paugan backs the river up a distance of thirty miles, submerging nine falls and rapids and creating a maximum head of 140 feet. Including bulk heads, the main dam is 917 feet long and its maximum height is 150 feet. The east sluice dam has a length of 570 feet, including bulk heads, and its maximum height is fifty feet.

Twenty-six miles below Paugan is the new Chelsea hydro-electric plant of Gatineau Power Company, and a mile below

PAUGAN FALLS POWER PLANT OF THE GATINEAU POWER CO.



# Insulating Board Machinery For A New Industry

*New Problems* or at least the old problems in new and different phases.

The forming of pulp so "free" that it is hardly pulp at all, in the paper making sense.

The pressing of a continuous sheet ½ inch or more thick when finished, containing an enormous amount of water—no crushing, no bending, tender handling but definite results.

The drying—continuous, even, without buckling and with a surprisingly low steam consumption.

*Get Interested* if you have waste fibres of any kind, chips, sawmill waste, pulp screenings, corn stalks, bagasse. Send them to us for a commercial test.

Our Products Meet Our Promises

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Chelsea, the Farmers station has been in operation for a year. Of a combined designed capacity of 290,000 hp., these two plants have installed or in process of installation, generators aggregating 232,000 hp., and part of this power goes to the new Gatineau news print paper mill of Canadian International Paper Company, a few miles away.

With the operation of the three developments—Farmers, Chelsea, and Paugan—combined into a single system, Gatineau Power Company is utilizing to the best advantage the total fall in the Gatineau River for a distance of sixty-two miles from its mouth and is developing about two-thirds of the available head on the whole river. All the remaining head which can be developed economically is controlled by the company. The storage provided by the lakes created by the Chelsea and Paugan dams insures excellent short time regulation of the river and should eliminate all possibility of trouble from ice.

### Mercier Storage Dam

The Mercier storage dam was built by Gatineau Power Company under the direction of the Quebec Streams Commission, and is located about ninety miles above the Paugan plant. The reservoir formed by this dam will take care of the seasonal regulation of the Gatineau River. With an estimated storage capacity of one hundred billion cubic feet, it is one of the largest artificial storage reservoirs in the world. The reservoir has a surface area of 118 square miles and the length of its shore line is 350 miles.

One of the remarkable features of the construction of the Gatineau plants is that the aggregate actual cost of the entire system will vary from the estimates by less than one per cent. The developments, too, have been completed within the time originally scheduled.

The contract under which the Paugan station is delivering electric energy to the Hydro-Electric Power Commission of Ontario is one of two contracts which Gatineau Power Company has with the Commission, and is one of the largest power contracts ever signed. It runs for thirty years and calls for annually increasing quantities of power until October 1, 1931, when the fixed maximum demand will be 260,000 hp. and the total yearly kilowatt hours to be delivered approximately 1,190,000,000, which rate continues throughout the life of the contract.

Under the second contract which Gatineau Power Company has with the Hydro-Electric Power Commission of Ontario, an additional 100,000 hp. is reserved for the Commission, which agrees to take at least 60,000 hp. This power is to be taken in minimum annual increments of 6,000 hp. for ten years beginning October 1. The Commission will take the balance of the 100,000 hp. during the ten years as far as needed.

In addition to its stations on the Gatineau River, Gatineau Power Company has contracts for electric power with the City of Ottawa, Canada Cement Company, Limited, E. B. Eddy Company, Ottawa Electric Company, Gatineau Electric Light Company, Ltd., and with Canadian International Paper Company for use in its Gatineau news print paper mill and Kipawa and Hawkesbury bleached sulphite pulp mills.

In addition to its stations on the Gatineau River, Gatineau Power Company has hydro-electric plants on the Ottawa River and its tributaries with a capacity of 126,600 hp. installed and in process of installation.

### Rapid Construction and Expansion

Through its rapid construction and expansion program Gatineau Power Company has become one of the largest hydro-electric power producers on the continent. Its plants are within economic transmission distance of the largest markets for power in the Dominion of Canada, and are supplying energy for lighting purposes, electric railway operation, and for the manufacture of a variety of products. The total potential capacity of the company, including its undeveloped powers, is in excess of 1,100,000 hp. All of these powers are owned in fee or held under long term government licenses.

The starting of the Paugan development and the recent completion of hydro-electric plants at Grand Falls, New Brunswick, and Kent's Falls, New York, hydro-electric developments, draw attention to the great quantity of power which International Paper Company has developed and under construction.

In the United States, Canada, and Newfoundland, International Paper Company and its subsidiaries now have 913,100 hp. already developed and in process of construction nearing completion. An idea of the size of this power may be had from the fact that it is three and one-half times the developed capacity of the Muscle Shoals project and over 60 per cent greater than the developed power on the American side of Niagara Falls.

Of the 913,100 hp. of the company, 436,000 hp.—nearly one-half—is on the Gatineau River, in the Province of Quebec, in the hydro-electric plants of Gatineau Power Company. 126,600 hp. is in the developments of Gatineau Power Company on the Ottawa River and its tributaries. The Grand Falls, New Brunswick, station of Saint John River Power Company will have 80,000 hp. International Power and Paper Company of Newfoundland, Limited, has a hydro-electric plant at Deer Lake generating 98,000 hp. In the United States, International Paper Company has hydro-electric plants on the Hudson, Saranac, and Connecticut Rivers of a combined capacity of 62,500 hp.

The aggregate of these hydro-electric developments is 803,100 hp. and the balance of the power of the company—110,000 hp.—is in hydraulic power plants in its pulp and paper mills.

International Paper and Power Company, the new company which is to be formed as a holding company for the properties of International Paper Company, and which is expected to hold a very large majority of the common stock of New England Power Association, will have developed and under construction in the combined companies, water power developments of 1,300,000 hp. This total is capable of being increased through further development and through the utilization of undeveloped sites to a grand total of 2,600,000 hp.

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## Saranac Co. Adds New Cylinder Machine

The Saranac Pulp and Paper Company, Plattsburg, N. Y., during 1927-28 added to its paper making equipment a new cylinder machine 76 inches wide, with one 36-inch mold for tissue paper and sixteen 36-inch dryers. The machine is driven through a sectional electric drive which has worked out very successfully.

Considerable other paper making equipment was installed to improve quality, to increase production and to effect savings. Among the most important improvements are an Oliver Save-all, a Voith High Pressure stock inlet for 132-inch wire and a Trimby stock regulator. All the beaters have been rebuilt to the modern high speed, high density type with marked improvements, both as to quality of beating and capacity.

The company also added another hydro-electric plant during the year, having purchased the former Farmers Standard Carbide Company's plant on the Saranac River about a mile below its other hydro-electric station. The water wheel and generator equipment of the carbide plant has been changed over in part, three of the five 500 hp. units which were installed in the carbide plant having been rebuilt and rewound to give proper current characteristics. The two power plants are now developed for a maximum of 5000 hp. and will, when fully developed, furnish approximately 8500 hp. Further expansion is contemplated by the company in the near future.

---

## To Furnish Drives for Gulf States Mill

The Hill Clutch Machine and Foundry Company, Cleveland, has just been awarded contract by the Gulf States Paper Company for all the agitator equipment and driving mechanisms required in the company's new kraft mill at Tuscaloosa, Ala. This installation includes 19 vertical tank drives and 6 horizontal stock chest drives.

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# Pacific Northwest Production Now A Factor

## Test Period Successfully Passed and Pulp and Paper Industry in the Northwest Is Now Apparently Pointed to Broad and Successful Development—Union Bag & Paper Power Corp. and Hammermill Paper Co. Among Eastern Concerns to Locate on the Coast

By Charles R. Berry

WHAT, previous to the year 1927 might reasonably be considered as a great experiment, has been accorded the dignity and influence of a firmly established industry—and this by no less an authority or factor of determination than capital.

### Steady Upward Trend

However, no one can discount the gradual rise in the barometer of the pulp and paper industry since its inception. That it has had a steady, unbroken upward trend is history written in the score of successful mills scattered along the Pacific Coast. Therefore, it would be unnecessary repetition to cover in this article the era of general development the pulp and paper industry has experienced on the West Coast; for, while new as compared with the same industry in other parts of the country, it has been "three score years and ten" since the first mill was established.

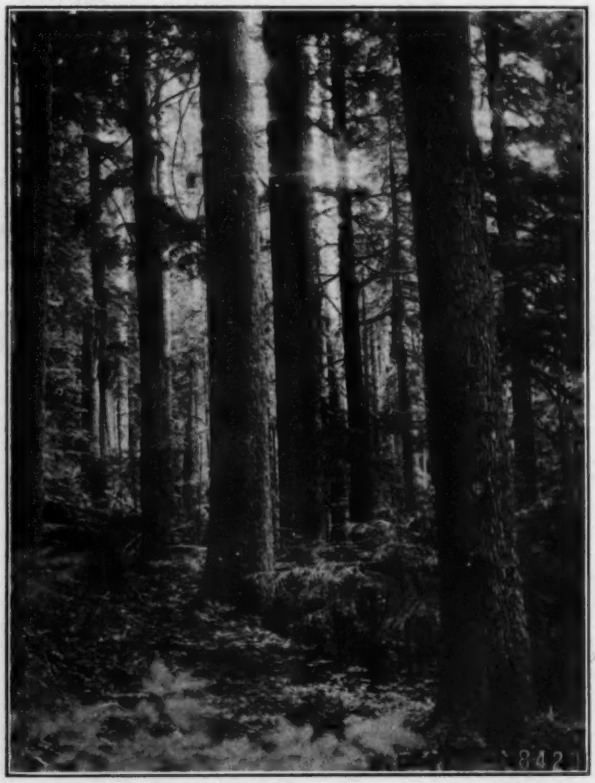
### "Testing Period" Analyzed

But a thorough analysis of the results of this, let us say, "test period" of development is not only timely but may be productive of real good; for in spite of our boasted dissemination of information these days, much misunderstanding and still more prejudice continues. The Westerner has a breezy way of "selling" his country and of marketing his commodities that the more cautious and conservative Easterner is always a little perplexed about—until he gets the Westerner's viewpoint, which is merely changing his view of the narrow end of an oblong structure to the side view—the latter always the Westerner's viewpoint—when the Easterner enthuses also.

Capital has, in the past two years gradually changed its attitude of open skepticism, to that of hearty cooperation; and when we speak of capital, it is pretty well understood to be, broadly speaking, Eastern capital—capital originating anywhere from Chicago to the eastward.

### A Natural Resource Impotent Without Capital

It is the axiomatic that whenever a great natural resource is found it lies inert until money can be attracted to it for its development. This even applies to the mining of precious metals—crude money itself; and as the commercial utilization of such a natural resource as timber, where the stages to its final conversion into money are long and numerous, capital investure is not only necessary, but its service must be more carefully planned and safeguarded because of this circumstance.



A REPRESENTATIVE STAND OF PULP TIMBER (WESTERN HEMLOCK AND SILVER FIR) IN THE SNOQUALMIE NATIONAL FOREST, WASHINGTON.

### The Westerner Enthuses

The Westerner, the Pacific Coast kind, enthuses and rhapsodizes in general about the great natural resources that lie about him everywhere and in particular does he enthuse about the apparently illimitable timber resource. True, he has seen much of the latter wasted, wantonly, perhaps, by ill planned logging methods and extravagant saw mills, but nevertheless, he somehow feels that the end is not yet in spite of the many disasters of the past; and today the average timberman, logger, sawmill operator and lumberman is reading as interestedly the journals of the pulp and paper industry as he is the timber and lumber periodicals. This much and more have the arbiters of capital investment gleaned about the situation on the Pacific Coast in the past year or two, and, perforce, are looking on the broad side of the structure along with the Westerner.

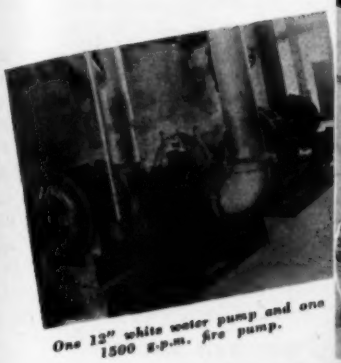
### Local Saturation Point Reached?

A year ago it was predicted the local point of saturation had about been reached. This prediction has not altogether been fulfilled. The local absorption of paper products manufactured here has been almost if not fully complete in spite of the new mills that have gone into production during a contemporaneous period. This unexpected situation has its answer in the quite abnormal increase of population of most of the Coast cities and, of course, due in a large measure also to the rapid expansion of the uses to which paper products are being applied.

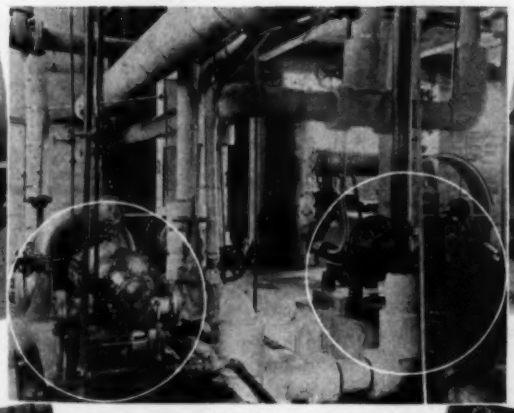
That the fruit and dairying industries of California, Oregon, Washington and Idaho are contributing largely to the increase of paper products is proven on every hand; the rapid increase in preference of the paper board container over that of wood has been most noticeable during the last few years. While the wood container has many good points in its favor, the attractiveness of the paper board box and package, leaving aside every other of the many advantages possessed by them, would be an excellent reason of its rapid adoption by fruitmen and dairymen. In so far as the local production of the paper board container goes, the saturation point of Pacific Coast

# 49 Warren Pumps at

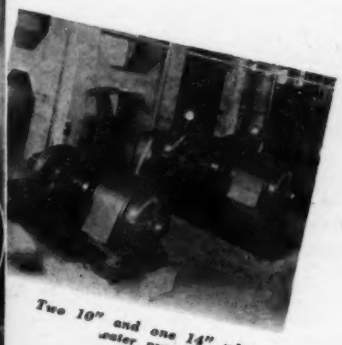
## Southern Advance Bag and Paper Co.-Hodge-Louisiana



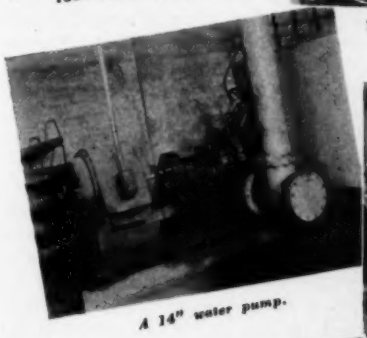
One 12" white water pump and one 1500 g.p.m. fire pump.



Two 4 stage centrifugal boiler feed pumps, 3550 r.p.m., 450 lbs. pressure.

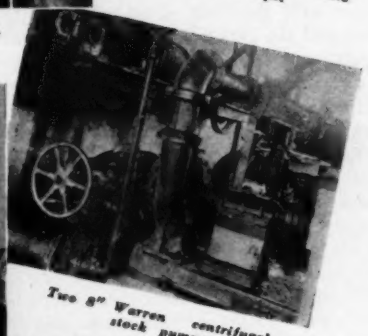


Two 10" and one 14" white water pumps.



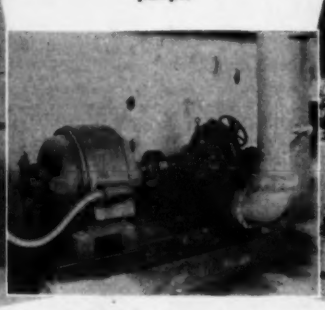
A 14" water pump.

Six 4" and 3" liquor and clear water pumps.

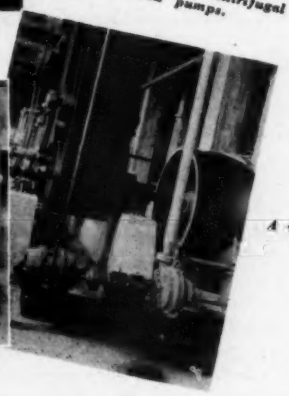


Two 8" Warren centrifugal stock pumps.

An 8" Warren centrifugal stock pump.



A 10" Double Suction Stock pump.



A 4" caustic liquor pump.

Warren

Steam Pump Company Inc.

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Agencies in all principal cities

2367

mills manufacturing those commodities may never be reached, for it simply resolves itself into a matter of speeding up production in order to fill this ever increasing demand.

### Capital Investment Enormous

Could all of the various factors entering into pulp and paper mill development be correlated, the sum total as revealed by such correlation might show a surprising situation, in favor of Pacific Coast developments of the industry over that of Eastern Canada, as applied strictly to the developments initiated during the past year. Many of these developments are not sufficiently advanced, however, to justify their inclusion in this mill review, but their reality is none the less evident, and coupled with the pulp and paper mills that have been finished during the past year and soon to be finished, it proves that the industry has experienced a most active year.

These projects have called for large outlays of capital; for the most part, they are mills of fairly large capacity. In addition to the new mills, substantial additions to existing mills have called for no small amounts of capital, fully justified in every instance, by the necessity for increased capacity.

### Strengthening Tendency to Acquire Timber Supply

There is a strong tendency on the part of pulp and paper mill operators towards the acquisition of sufficient bodies of timber to support the mills according to their various capacities, over what may be termed the period of re-growth; this acceleration is causing increasing interest in the pulping species of the West, even beyond the interest manifested in saw timber species, which latter, however, are at rather low ebb at the present time. Timber tracts of spruce, hemlock, cottonwood and the like are being taken under control by pulp and paper mill operators to a much greater extent than ever before. While these guaranteed timber supplies may be regarded as frozen assets, the hit and miss practice the early mills on the Coast pursued—that of buying their pulp wood on the open market has now practically disappeared. Most all of the large pulp timber areas in the states of Washington and Oregon are under investigation by the operators of pulp and paper mills and it is now common practice for the prospective mill to include in its initial listing of assets, a stand of timber proportionate to its needs.

### Utilization of Waste Encouraging

There are three or four pulp mills now using almost one hundred per cent waste wood from saw mills and box shook factories. So far as these particular mill have gone, the working up of the waste wood products seems to have all of the elements of success. Some little difficulty has been experienced in grinding or chipping a mixture of hemlock and fir on account of the resin content of the latter, which clogs the screens to such an extent as to halt the operations too frequently for an economic success. However, at least one mill, a large kraft operation, has solved the troubles incident to the use of fir waste. Douglas fir and Pondosa pine undoubtedly in the future will be widely used pulping woods, which up to the present have been found to be too refractory for practical consideration, except in laboratory experiments. The large and constantly widening uses to which Sitka spruce may be applied, in the shape of wood specialties, may sound the knell of doom for the continuing use of that wood species for paper pulp. Its applicability for material for airplanes at a price of around two hundred and fifty dollars per thousand feet, even while the quantity required for such purposes is very limited, places it on a pedestal of quality not to be approached by pulp operators. Its use as a rayon pulp may, however, be economically possible. Yet the vast percentage of lesser grade spruce, too inferior in quality for products requiring select timber, will continue to supply the pulp mills of the Pacific Coast for a long time to come, and the constant elevating of the lowly Western hemlock to the position of a high quality pulp timber, will without doubt solve the matter of the elimination of other woods most satisfactorily.

### Recent Successful Wood Experiments

The recent experiments conducted by the Forest Products Laboratory, Madison, Wis., for the New Zealand government, point the way out of some of the grave difficulties and serious obstacles that have confronted those who have for a long time been advocating that "for every tree cut down, another shall be planted." These experiments, signally successful, prove beyond the shadow of doubt that deciduous trees, the hardwoods, make excellent pulp for high grade papers as well as news print. The writer may be pardoned at this juncture, to state that this fact substantiates what he has long held as the future course for reforestation methods to follow. Plant the deciduous tree, or better still, let nature plant it, and the crop of pulp timber will be avaialble in half the time of the slower growing conifers. On the Pacific Coast are such species as red alder, cottonwood, soft maple and others somewhat related to these, that attain a marvelous and rapid growth. Fire, the principal scourge of the timber area, finds little encouragement in these hardwood stands and there are some significant economies in harvesting these species which have matured in a uniformity of size. But reforesting experts have much to learn in observing an appropriate crop rotation and in the Northwest ideas are too firmly fixed on the conifer species to expect much progress along the lines of natural selection, for a long time at least.

### Eastern Mills Move West

In one respect, a prediction recently appearing in the PAPER TRADE JOURNAL has been, or is being fulfilled. That is the moving of paper mills from the East to the West Coast to operate in tandem with pulp mlls. This has been realized in the case of the Hammermill Paper Company, one of the strong Eastern concerns manufacturing bonds and writing papers; it has "hooked up" with the Zellerbach Paper Company which is building a large pulp mill at Hoquiam, Wash. It is understood that the connection exists only in the case of the Hoquiam plant, but the arrangement along similar lines will become quite a popular procedure during the next few years. The trend in this respect is also noted in the case of the Union Bag and Paper Power Corporation, which is now completing a large kraft mill at Tacoma, Wash. This is a pulp and paper mill of a rated capacity of 150 tons per 24 hours; it is designed to use to a large extent, the waste wood coming from a new hemlock saw mill that has been set in operation adjoining the pulp and paper mill; while it is hardly probable that the waste wood from the saw mill will provide sufficient pulp material for this capacity mill, it is planned to be the basis at least, of the pulp mill supply.

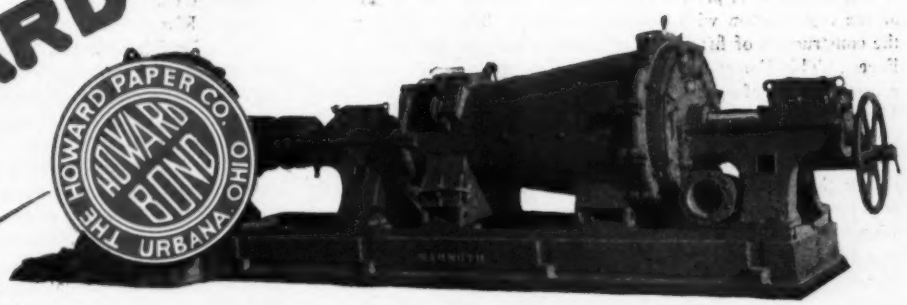
In another direction too, this same tendency is illustrated; that is the establishing of the electrochemical industry on the Pacific Coast. In Tacoma, Wash. two large concerns manufacturing chemicals for the pulp and paper industry, have in the past few months commenced the erection of fine, large plants to accommodate the rapidly expanding business in these lines.

### Test Rail Shipments Prove Encouraging

The San Juan Pulp Manufacturing Company, Bellingham, Wash., has shipped by rail its product to the mid-West and is preparing to ship more. Under the new 60 cent rate from northern Pacific coast points to Chicago, Missouri and Mississippi river points, the rail shipment of western pulp eastward seems quite practicable. This will no doubt encourage the tapping of the great hinterland forests and the establishment of pulp and paper mills at interior points will follow as a logical sequence. It is not surprising that the great transcontinental railway lines will contest with the water shipping lines for pulp cargoes; this wood product, being a more highly manufactured commodity than lumber, should constitute a very probable factor in transportation by other than the ocean, particularly, where located inland—and that is where the bulk of the exclusively pulp timber is now to be found.

There is a strong likelihood that at least two pulp and paper concerns will locate at interior points; at this date, neither of

# HOWARD BOND




## "The Nation's Business Paper"

"Compare it! Tear it! Test it!", says the Howard Paper Co., of Urbana, Ohio,—with confidence. Confidence in the substantial bulk, the opaque whiteness, the exceptional uniformity, the fine printing and writing surfaces, the versatility and economy that have won acceptance for Howard Bonds and Ledgers in the foremost business offices of the nation.

Confidence such as this is founded on confidence-breeding equipment. Which means, for instance, that the Howard mill at Urbana, as well as the associate Aetna and Maxwell plants, are 100% Noble & Wood Jordan equipped.

It is of interest that Howard specifies,—and insists on—Noble & Wood Special Bronze Jordan Fillings,— a contributing factor to the uniformly high quality of Howard Bond.

No mill can turn out quality products without quality equipment. That is why you find so many Noble & Wood installations in the mills that make quality —without sacrifice of economical production,—their keynote.

**NOBLE & WOOD**
MACHINE COMPANY
Hoosick Falls New York

the two in mind have done more than make a survey of their respective locations, but are reported as having strong indications of a successful outcome of their respective plans. One of these is a proposed news print mill at Salt Lake City, Utah. Thos. H. Tracy, manager, is placing a $10,000,000 issue of the capital stock of the organization with eastern financiers. The program entails the construction of fifty miles of railroad into the Powell National Forest. This Forest timber is deal for pulp, being almost entirely a small species of spruce, where over a billion feet is to be found. The other inland mill is proposed for the Columbia river basin, probably at Wenatchee, Wash. The concern, not yet incorporated, is the Wenatchee Pulp and Paper Mills and is being handled by Seattle, Wash., men. They are taking over a large tract of Pondosa pine, industrial sites and power rights on the Entiat river, near Wenatchee and so far as the program is worked out they will put in a 100-ton kraft mill. Both of these inland mills would dispose of much of their product to the orchardists of their respective districts. The rail shipments eastward from both of these points must be elevated over one mountain range—the Rockies, to reach Mid-West points of consumption.

### New Mills

The number of new mills coming into production since the last Mill Number of the PAPER TRADE JOURNAL is not great; three, a pulp and paper mill at Newberg, Ore., the Spaulding Pulp and Paper Company, a paper mill at Longview, Wash., the Longview Fibre Company, and the Rainier Pulp and Paper Co., at Shelton, Wash., represent the sum total, each of which has been described. However, within the next five months another four will undoubtedly be in operation; these are the Zellerbach Paper Company's new pulp mill at Hoquiam, the same concern's Port Townsend mill and the Union Bag and Paper Power Corporation's kraft mill at Tacoma; the fourth, at Tacoma, being the Shaffer Box Company, a sulphite pulp mill, which is nearing completion; these are all in the state of Washington. In the electro-chemical industry, are two at Tacoma, one, the Tacoma Electrochemical Company, rapdly nearing completion and the other, the Hooker Chemical Corporation being under way.

Progress picturization in a number of the foregoing instances, together with a description and personnel of the respective concerns will be found in this issue.

### Mills Partially Developed

Those of the projects that have progressed to a probability are the Northwestern Pulp and Paper Company, Astoria, Ore., which has acquired an industrial site, water franchiess, and timber supply and is now breaking ground for its mill buildings; B. T. McBain is consulting engineer; the West Pulp and Paper Company has acquired some extensive timber holdings, industrial concessions from the city of Raymond, Wash., and is doing some preparatory filling on its mill site at that city; a second unit of the Zellerbach Paper Company at Port Townsend, Wash., is partially developed.

### Mills Projected, But Still in Promotion Stage

There are always a healthy number of these in the Northwest. Incidentally, the majority of them do finally succeed. Of these, as in the case of the mills about to commence operations, the number of so-called "independents" is on the the increase. The road to success of these is invariably longer, but upon proof of able management and assurances of an outlet for their product, they sooner or later receive the financial assistance necessary for their development.

Among these are the following:

Seattle Pulp and Paper Mills, Inc. Will be the first pulp and paper mill for Seattle, Wash. Under the financial care of Tom G. Taylor Company, Portland and Seattle. It is understood that this concern has secured water rights from the state of the flow of the White river, and that the mill location is on the Duwamish river, in the south industrial district of Seattle.

Hammermill Paper Company. An eastern concern, to locate a paper mill adjoining the Grays Harbor Pulp Company, at Hoquiam, Wash. A certainty for next year and already financed.

Fraser River Pulp Mills, Limited. To be located at New Westminster, British Columbia. To be of 75 tons capacity of pulp by the Mitscherlich process. Chas. G. Heifner, Seattle, Wash., has general charge of its organization.

News print mill of 100 tons capacity for Salt Lake City, Utah. According to Thos. H. Tracy, its general manager, a stock issue of $10,000,000 is being floated in eastern financial centers for the development of the project and the building of a railroad into the Powell National Forest, where the timber supply will be obtained.

Wenatchee Pulp and Paper Mills, Inc. Sponsored by Seattle and Wenatchee men, who have options on large tracts of timberland adjoining the Wenatchee National Forest, industrial sites at Wenatchee and Entiat, Wash. and power rights on the Entiat river. The location is planned to be at Wenatchee and is to be of about 100 tons of pulp and 50 tons of fruit wraps and similar paper products per day, which likely will be all contracted for in that district.

The Hama Hama Pulp and Pajer Company, Olympia, Wash., is preparing plans for a proposed mill on the Hama Hama river, Hoods Canal, Wash. Elbert H. Chandler is their consulting engineer.

The mammoth project of the Canadian-Crown Willamette at Campbell river, B. C., is advancing slowly, owing to the objections of the Fisheries Bureau, because of the menace to fish in Buttles Lake from the proposed damming and flooding of its waters by hydroelectric developments.

### Additions and Improvements

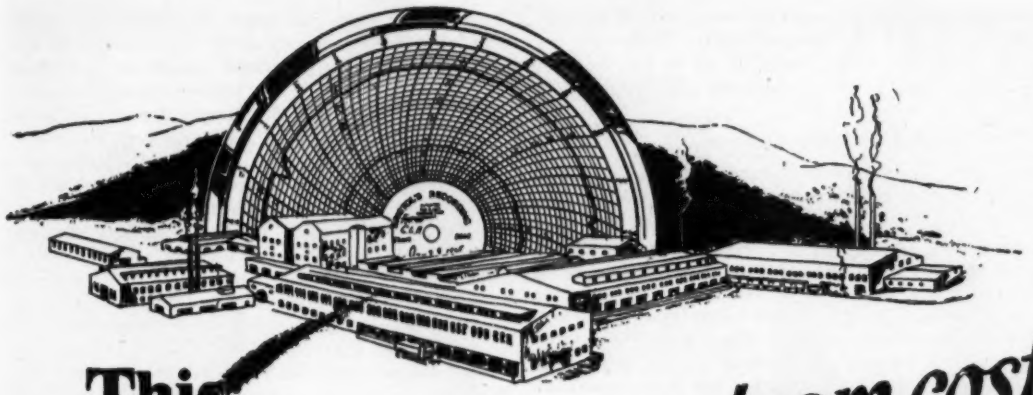
The Jaite Company, Jaite, Ohio, paper bag manufacturers, has installed the very latest bag making machinery in a modern building adjoining the St. Helens mill and is already shipping its product to cities and towns of the Northwest. Harry O. Strom is the local manager of the Jaite Company.

It is also very recently announced that the St. Helens Pulp and Paper Company will immediately install a plant at St. Helens in connection with its paper mill for the production of paper bags, which the company announces will be ready for operation sometime in December. The St. Helens Pulp and Paper Company has purchased the business and plant of the California Bag and Paper Company at Emeryville, Cal. and will dismantle the plant and remove the equipment to St. Helens. The new plant will make paper bags of all sizes, especially for the grocery trade. Manager Oberdorfer states that establishing the plant at St. Helens brings the production end in closer proximity to the supply of raw material with the resulting economies in freight charges.

The Spaulding Pulp and Paper Company, Newberg, Ore., has made a number of improvements in its mill which has been operating for the past ten months. A new log haul has been installed that elevates the logs from the river and cold decks them alongside the wood room. This and other improvements in the wood room have increased the capacity of the mill considerably.

### Big Merger Effected

One of the outstanding incidents of the industry on the Pacific Coast during the last year, has been that of the merger of the Crown-Williamette Paper Company with the Zellerbach Paper Corporation. The former concern has long been the big producer of paper products on the Coast, principally in Oregon, but the rise of the Zellerbach concern has been no less phenomenal, having its commencement in California as paper jobbers. Prior to this merging of the Crown-Willamette and the Zellerbach companies, a merger of the Paraffine Companies, Inc., with the Zellerbach Paper Corporation had been consummated. This combination of three large producers and jobbers gives the West



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Profits, to a large extent, must come from additional savings through reduction in operating costs. But where to save on costs without interfering with operating schedules. Is this a problem being faced in your mill?

Scores of the most successful mills have already solved the problem by reductions in the operating cost of their heating and ventilating. With specifically designed Ross equipment it has been possible to effect the necessary savings from steam costs, lowered by positive utilization of heat, reclaimed from waste vapor. Putting waste to work is the most satisfactory method of saving.

**Get in touch with our engineers regarding opportunities in your plant**

Their experience in mills similar to your own can prove of real advantage to you. Consult us without obligation or write for our book—Heating and Ventilating Paper Mills.

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NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS
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Coast an industrial organization similar to that of the International Paper Company in the East and Eastern Canada. Their mills extend along the coast from Ocean Falls, B. C. to Los Angeles, Cal., with jobbing houses in all of the cities and towns in the West

### Alaskan Activities Continue

Timber and power surveys for the Cameron-Chandler and Zellerbach interests continue in Southeastern Alaska, on their respective allotments which were awarded them by the U S. Forest Service. Two groups of cruisers and engineers are conducting examinations that are expected to continue for another year; much of the areas now being cruised have been gone over by former applicants, but being of a private nature is not available for general use. The Hydrographic Bureau of the Navy quite thoroughly air-mapped these areas, bringing to view many surprises in the way of lakes and streams, that will prove most valuable to those now conducting examinations.

There is considerable activity also in the states of Oregon and Washington and the province of British Columbia by investigators and timber cruisers. Several stands of pulp timber of one billion feet and over have been segregated into pulp timber units in order to not confuse them with timber for lumber purposes, thus enabling the prospective pulp mill operator to make a ready selection without having to go into the saw mill business.

In closing this Mill Review, to the writer it is his privilege to quote briefly W. G. Weigle, Supervisor Snoqualmie National Forest, a man who, perhaps, has as keen a comprehension of the pulp timber resources as any man in the West:

"It is hard to conceive of a more ideal location for pulp and paper plants than the Puget Sound region of the Pacific Northwest. Puget Sound has an equitable climate, free from storms, which makes it a desirable place in which to live and helps solve the labor problem. Puget Sound is tributary to more than 100 billion feet of timber and when I say tributary I mean that the timber is so located that there is no difficulty in placing it in Puget Sound within 24 hours from the time the tree is logged. Much of this timber is less than 50 miles from tidewater and all of it is less than 100 miles. It is common custom at the present time on all of the logging operations tributary to Puget Sound to load the cars with logs during the day and haul them to tidewater during the night. This condition in itself is a great factor in cutting down the price of raw material when compared to the time required for transporting pulp wood in the Northwest where it is not infrequent to require a whole season to transport wood from the stump to the mill and sometimes two seasons are required.

"More than half of this timber consists of Douglas fir and western red cedar whch will largely be turned into lumber. The remainder, however, consists chiefly of western hemlock and silver fir, both of which are considered valuable for paper making. More than 50 billion feet of the timber referred to as tributary to Puget Sound, lies within the Olympic, Rainier, Snoqualmie and Mt. Baker National Forests. A very large percentage of the Douglas fir within this timber belt lies outside and adjacent to the National Forests and a heavy percentage of the timber within the National Forests consists of western hemlock and silver fir. The Snoqualmie National Forest, which lies directly east and close to Puget Sound, contains a very heavy mixture of western hemlock and silver fir. The South Fork of the Stilaguamish also contains large amounts of these species. Therefore, some points on Puget Sound, adjacent to this standing timber, would be an ideal location to give a plant a very long life. When we consider the short distance of transportation from stump to tidewater and then the short haul on protected waters to any part of the Sound, there is no reason why any plant located on Puget Sound could not be directly tributary to all of the timber within the region adjacent to Puget Sound."

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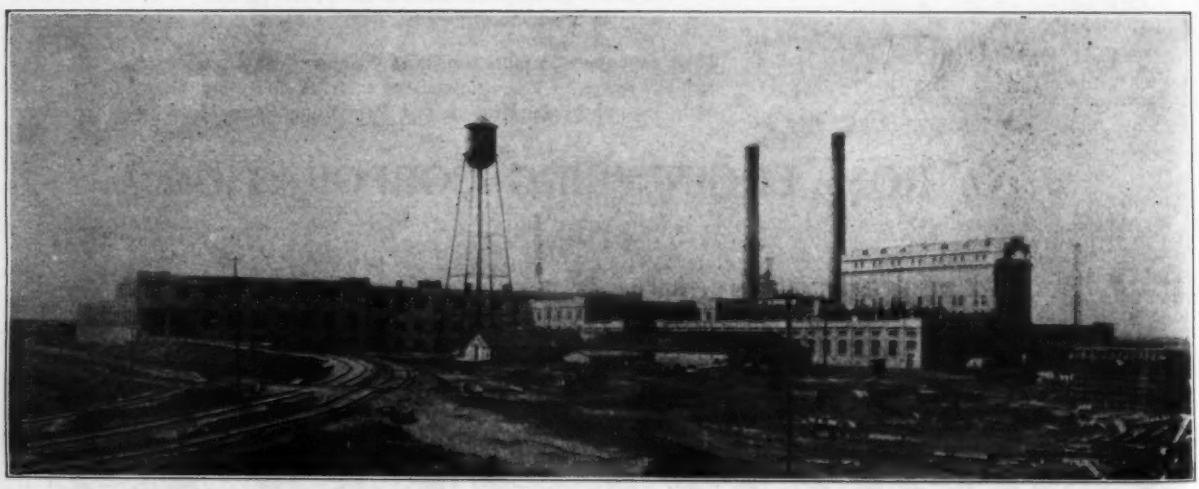
### Piqua Paper Concerns Exhibit

DAYTON, Ohio, Oct. 15, 1928.—Piqua, an enterprising town of 20,000 population, north of Dayton, was the scene of an interesting Exposition this week in celebration of the Hallowe'en season and the completion of a new Market House and a new City Hall, in addition to the improvement of the Public Square from which the old City Building was removed.

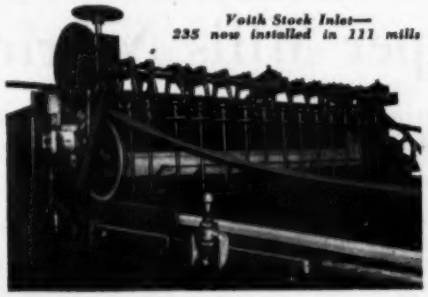
Virtually all of the larger concerns in the Border City were represented at the Exposition and some splendid displays were arranged for the inspection of the public. The aim was to acquaint the people of Piqua and surrounding towns with the nature of the products manufactured in the various mills and factories.

Not the least interesting display was made by the Orr Felt and Blanket Company, one of the oldest and one of the largest manufactories in Piqua. This concern has dealt with the paper trade throughout the United States for many years and is nationally known. The plant, located at the southern end of Main street, is one of the most modern in Ohio. Everything about the establishment betokens enterprise and thrift. Motorists passing through the city from north to south on the Dixie highway are impressed with the neatness of the factory layout and the attractive and home-like atmosphere existing.

Other representatives of the paper trade giving exhibits were the Piqua Paper Box Company, the Piqua Straw Board Company, the Piqua Cap Company, manufacturers of milk bottle caps.



NEW PULP AND NEWS PRINT MILL OF SPRUCE FALLS POWER & PAPER CO. AT KAPUSKASING, ONT.



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That will give steady performance in the pulp or paper mill, let us tell you how Valley equipment will meet your requirements. Backed by our years of experience making pulp and paper mill machinery, and installations throughout the country, each piece of equipment shown here is built for real service. Write for booklets describing the individual machines.

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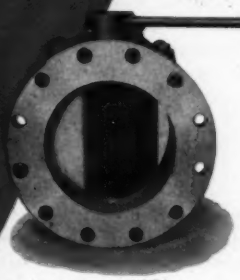
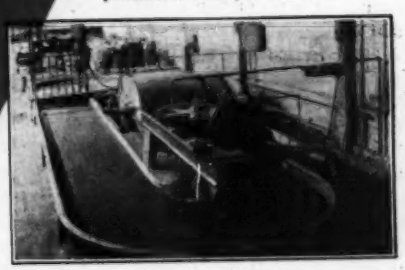


Voith Screw Press for dewatering pulp

Niagara Beater—189 installed in mills throughout the country

Valley Breaker Beater — lower production costs for board mills



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# Great Lakes Paper Mills Nearing Completion

## One Machine Installed and Running Smoothly and First Production of News Print Shipped—Another Machine Should Be Ready to Operate by End of Year, Increasing Capacity of Plant to More Than 200 Tons Daily—Sulphite House Will Contain Three Digesters

[FROM OUR REGULAR CORRESPONDENT]

TOTONTO, Ont., October 22, 1928.—E. W. Backus, Minneapolis, Minn., who is first vice-president of the Great Lakes Paper Mills, West Fort William, Ont., which recently shipped its first production of news print, was a visitor to the head of the Lakes recently. "One machine is now completed," Mr. Backus said, "and is now running as smoothly as can be desired. The other machine which I hope will be completed by the end of this year or the begininng of next, will be a 304-inch Fourdrinier, and will increase the capacity of the plant to well over 200 tons of news print per day. With the completion of the new machine we also hope to complete our sulphite house. This will comprise three digesters, and will supply all the sulphite used in the manufacture of the news print at the mill, which we are at present receiving from Kenora. When the entire plant is complete it is rather difficult to say how many men will be employed, as we have large timber tracts in the district. This added to the help employed at the mill itself, will bring the total up to a considerable figure."

"The present deadlock in the news print situation in Canada," added Mr. Backus, "if given time, naturally will right itself. I think that the breaking up of the Canadian Newsprint Company in Montreal did the trade no good. The effect of this company was to stabilize prices that have since gone wild. It is not the large combine that is responsible for the cutting of prices, rather it is the small producer who does not see the harm he is doing by undercutting the market. It is to the advantage of publishers, consumers, mill owners and an entire community to maintain a level scale of prices in the news print industry. At present in the news print trade there is not sufficient business to go around all the mills operating, but if all the business was to be shared equally, there would be enough work to keep them going full time five days a week. At present there is less than 80 per cent consumption of production capacity. Nothing is to be gained by this continual cutting of one another's throat, and, undoubtedly the trade will find its feet in the near future."

### A. P. Costigane Visits Hawkesbury Mill

A. P. Costigane, secretary-engineer of the Ontario Pulp and Paper Makers' Safety Association, has returned to Toronto after a visit of inspection to the Hawkesbury mill of the International Paper Company. While there he went into the question of policy in connection with group meetings of the eastern section. An interesting program for the next meeting of the section has been arranged and if carried out should give a fillip to accident prevention in the mills of the members of the group. Mr. Costigane said that the Hawkesbury mill of the International Paper Company has, during the past two years, improved as far as physical fire hazards are concerned and such improvements are now being reflected in the company's accident prevention records, which so far this year has been a good one. A visit was also paid to the Campbellford, Ont., mill of the Canadian Boxboard Company, which is temporarily shut down since the building of the company's new plant in Toronto. A visit to the mill of the J. R. Booth Company at Ottawa will be made at a later date. On the whole Mr. Costigane expressed himself as being satisfied with the progress that has been made during the past six months in accident prevention in spite of the somewhat difficult situation being faced by the news print industry at the present time.

### Plane to Be Aerial Pepper Shaker

The D.H. 61 plane used by the Ontario Forestry Air Service has been found satisfactory as an aerial "pepper shaker" and will likely be used next season on an extensive scale for combatting insect pests. The "hemlock looper," which a couple of months ago was reported in the Lake Joseph area of Muskoka, destroying trees, has also been found in the neighborhood of Brockville, Ont., and next year, at the proper time, the D.H. 61 will be put on the job. It has been fitted with a hopper which will carry at least a half-ton of calcium arsenate, and in June and the first half of July, next year, will be found dusting this species of forest pest, which has spread rapidly this year.

### Spruce Falls Men Return To Work

Following a three-hour conference at North Bay with representatives of the employees of the Spruce Falls Power and Paper Company, Ltd., Kapuskasing, Ont., the Hon. Peter Heenan, Minister of Labor, announced that he felt confident that the strike would be settled to the complete satisfaction of both the employers and the employees. The strike was instituted when four men who had been elcted officrs of a newly-formed local branch of the Paper Makers' Union were discharged. About 45 men went on strike. All went back to work on the advice of Mr. Heenan, with the exception of four officers of the union. The other men returned to work after obtaining the assurance from Mr. Heenan that they would stand a much better chance of having their grievances satisfactorily settled if they returned to work, while he directed the negotiations between their representatives and th employers.

### Notes and Jottings of the Trade

The Buntin Reid Company, Ltd., one of Toronto's leading wholesale paper firms, it is stated, contemplate erecting a new building. They are located now on Colborne street, in the heart of the down town section, and are said to be desirous of moving westward to the vicinity of King and Spadina, which is becoming a printing and paper district. Several properties have been looked at but no announcement has been made yet as to where the firm will locate its new home.

George E. Smith, formerly of Warwick Bros. & Rutter, manufacturing stationers, and the Copeland-Chatterson Company, is the president of a new company formed in Toronto under the name of Associated Bookbinders, Ltd., whose charter also empowers them to engage in the wholesale paper business. Their activities will for a time, at least, be confined to bookbinding and paper ruling.

The Don Valley Paper Company, Ltd., Toronto, has been granted a provincial charter with power to engage in the manufacture and distribution of paper and with a capital of 1,500 preferred shares at $100 and 5,000 common shares of no par value.

With authority to engage in the manufacture of envelopes and paper bags, as well as a general printing business, the Regent Press, Ltd., have been granted an Ontario charter. The company is capitalized at 250 shares preferred and 7,500 common shares. The headquarters are in Toronto.

Hugh Dandridge, for some years a popular employee in the office of Ritchie & Ramsay, coated paper manufacturers, Toronto, has gone to Montreal, where he has joined the Howard Smith Paper Mills staff.

S. J. Frame, secretary of the Canadian Paper Box Manufacturers and of the Toronto Carton Council, has returned to Toronto after a short visit to the British Isles and expressed himself as convinced that the British people were quite capable of weathering all financial and commercial storms created by the Great War.

Edward Cooper, formerly of the Western Quebec Paper Mills, Ltd., of St. Andrews, East, Quebec, is now with the Don Valley Paper Company, Ltd., of Todmorden, Toronto, as assistant superintendent.

# strength

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# Paper Exhibits Feature Direct Mail Convention

## Leading Mills Display Their Products Attractively at Big International Gathering in Philadelphia—Many Interesting Addresses Rendered By Well Known Executives of the Paper Industry—Thousands of Visitors Attend

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 22, 1928.—The most important event that interested the paper industry during the past week was the International Direct Mail Advertisers Convention, where trade products occupied an outstanding part in the matter of displays and topics for review by the various speakers. Trade associates also took a prominent part in the executive and other committees responsible for the success of the convention, which attracted thousands of visitors from all parts of the world.

The convention brought together the largest assembly of products of leading paper mills of the country devoted to the manufacture of advertising specialties and printed papers and represented the most comprehensive exhibit of manufacturing firms ever held in the city. A large section of the 12th floor of Gimbel Brothers department store set aside for the direct mail exhibits was given over to the display of the paper mills, while officials and sales executives journeyed here from all sections of the nation to supervise the exhibits and extend welcome to the direct mail ad men who attended the convention.

The convention opened on Wednesday with a series of business sessions held in the Benjamin Franklin Hotel when President Homer J. Buckley, of the Direct Mail Advertising Association and head of Buckley-Dement Company, Chicago, welcomed the trade and its allies on behalf of the membership. Other greetings were extended by President Louis Wheelock, of the Poor Richard Club, the local advertising organization. At the Wednesday afternoon session, Rollin C. Ayres, of the Zellerbach Paper Company, San Francisco, presided, and expressed the welcome extended the advertisers by the paper industry. In the course of the afternoon session, Cy Norton, advertising manager of the Strathmore Paper Company, Mittineague, Mass., talked on "How Strathmore Uses Nine Varieties of Direct Mail—and Makes Them All Pay," in which he high lighted forty beliefs on which Strathmore advertising is built. They were the belief that quality outpulls cheaper advertising much more than greater cost; campaigns are much more effective than individual piece advertising; that advertising should not only exploit products but offer a constructive helpful service and lastly, after all, advertising is merely common sense selling. He then explained the nine varieties of Strathmore. He told his audience in a survey of the entire direct mail market and after observing the terrific competition in it, the most important factor to watch for in direct mail is to be sure each piece of direct mail is good enough to sell to the individual reader. The line of direct mail ad matter of the Strathmore Paper Company was shown in a special booth over which Mr. Norton presided, with Professor C. M. Bolser, assistant advertising manager, as staff aid from the Mittineague Mills, featuring sixteen displays and specimens of fine printed ad matter from all parts of the nation.

### Paper Men On Committees

Paper trade associates who served in official capacity or on various committees were: Rollin C. Ayers, Zellerbach Paper Company, San Francisco, Cal., International Board of Governors; George W. Ward, D. L. Ward Company, Philadelphia, International Board of Governors, and Executive Committee; Cy Norton, Strathmore Paper Company, Nominating Committee; Harry Donahue, Molten Paper Company, Philadelphia, Blotter Committee; Norbert A. Considine, of The Paper House of Pennsylvania, Executive Committee and Chairman of the Entertainment Committee; J. T. Fenner, A. M. Collins Manufacturing Company, Philadelphia; Charles Megarge Levis, Curtis and Brother Company, Philadelphia, on the Executive Committee; William S. Wilcox, Wilcox, Walter, Furlong Company, Philadelphia Hotel and Exposition Committees; Herbert S. Foster, A. M. Collins Manufacturing Company, Philadelphia, Educational Exhibit Committee; John O. Franz, A. Hartung, Inc., Philadelphia, Hotel and Membership Committees; Robert T. Brown, Brown and Bailey, Philadelphia, M. K. Christine, Raymond and McNutt, Philadelphia, Membership Committee; W. E. Schockley, A. M. Collins Manufacturing Company, Hotel Committee; Miss Catherine A. Woods, Paper House of Pennsylvania, Philadelphia Club of Advertising Women; and Leon Beck, Charles Beck Paper Company, Attendance Committee.

At the Thursday afternoon business session, Timothy Thrift, of Elmira, N. Y., assistant sales manager of the American Sales Book Company, Ltd., was elected president of the D. M. A. A., while the retiring president, Homer J. Buckley, was honorary vice president; H. C. Lowery, Toronto, first vice president; Frank L. Pierce, Detroit, secretary and treasurer, and C. E. Conybeare, Lancaster, Pa., and Benjamin Sweetland, New York, governors. Trade trophies from the paper industry were awarded by the Albemarle Paper Company, Richmond, Va., in the form of an expensive set of golf clubs, to John F. Coakley, of the Edison Storage Battery Company, Orange, N. J., for the best and most effective blotter advertising campaign between the years of 1927-28, conducted by the Edison Company advertising manager, to whom the award was given by the mills whose slogan, "Blotter Advertising Pays," is well known to the paper industry. The Standard Envelope Manufacturing Company awarded a bronze plaque for the most distinctive silver tone envelope used during 1928 from standpoints of color, typography and layout, to be decided at the end of the year. During the convention attractive exhibits were shown by the following paper houses:

### Albemarle Paper Co.

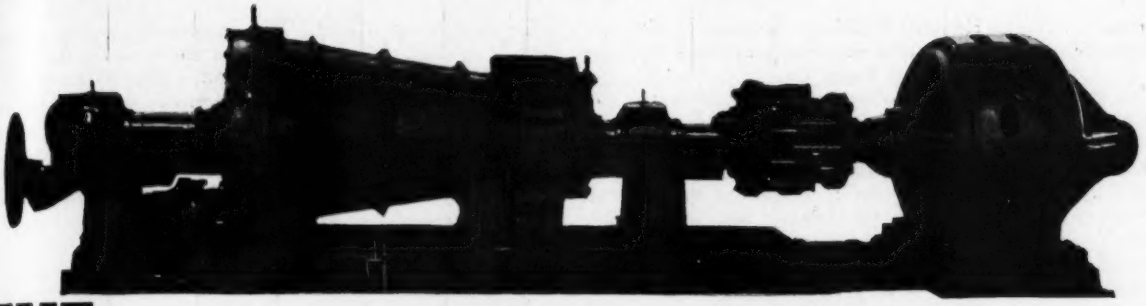
The trophy, a set of golf clubs valued at $125, awarded for the most effective blotter campaigning during the past year, was on display at the booth of the Albemarle Paper Company, where John R. Diggs, vice president of the company, presided, assisted by Advertising Manager Franklin Dorset. There were displayed a wide range of blotters surrounding a map showing the world wide use of blotter advertising with streamer attached to the nation at one end and an actual specimen of advertising blotter from the country attached at the other.

### Appleton Coated Paper Co.

Direct sales bonds, coated one side, made up into attractive portfolios, were distributed by the Appleton Coated Paper Company, Appleton, Wis. Two new lines were shown by the mill representatives, E. S. Colvin and H. B. Berge. They were the new Polychrome Dull Coated Book Papers, which were enlivened by the artistic effectiveness of the samplers on display from actual printed ad matter, and the new modernistic colored papers in the Woodbine Colored Enamel, a dull coated book grade with many brilliantly hued lines that meet the modern taste for colorfulness.

### American Writing Paper Co.

With a varied distributive representation in the local paper houses, the American Writing Paper Company had several means of displaying its lines. The outstanding products of the A. W. P. Company were the American Handcraft in Eagle-A Deckle Edged Papers and the New Herculean Cover Paper. The local manager, Fredrick Hasting, attended the convention as representative of



# THE No. 2 EMERSON JORDAN

## *is equipped with*
## TIMKEN ROLLER BEARINGS

### *A New Epoch in the paper making industry*

**The No. 2 Emerson Jordan, shown above, is a masterpiece of refining equipment, having Timken Roller Bearings and Bandless Plug. This sturdy, well constructed bearing application is just another characteristic of Emerson Quality and progressive engineering.**

***Features to Consider.***

**(1) Timken Roller Bearings, both radial and thrust, are mounted on taper-bored sleeves.**

**(2) Bearings are enclosed in sealed housings that prevent the bearing troubles generally experienced when bearings are mounted directly on the shaft.**

**(3) Bearings are NOT mounted directly on the shaft.**

## THE EMERSON MANUFACTURING CO. Lawrence, Mass.

the manufacturers in Holyoke, dividing his attention between the large number of distributors at the exhibition who handle the lines.

**Beckett Paper Co.**

With its paper making history of more than 80 years, the Beckett Paper Company, Hamilton, Ohio, gave prominence to its old established line, the Buckeye covers, appropriately designed in gold with the "Spirit of '76" trio that has inspired the nation's patriotic spirit for many generations. There was an attractive and appropriate design in the gilt Liberty Bell, showing the Double Thick Buckeye in a double folder effect in the bell. The big feature that was of interest to the direct mail advertisers was the new Beckett Offset made in white and India and samplers ready for the trade were freely distributed. W. V. Williams, sales manager, was in charge of the exhibit.

**Champion Coated Paper Co.**

An entire booth was given over to the "Champion Book of Decorative Material" with its 427 different creations of borders head bands, tail pieces, flower ornaments and initials, all designed by prominent artists in the field of illustration as part of the contribution from the Champion Coated Paper Company, Hamilton, Ohio. This exhibit was apart from that held by the number of local paper firms distributing the Champion products. Along with the special decorative book were displays of the Aigrette Enamel and the Hingefold Enamels. The booth was under direction of the mill advertising director, E. Kenneth Hunt, and represented by two delegates to the convention from the Cleveland office and the local manager, Charles A. Labor. Manager Joseph D. Reed, Jr., who looks after Detroit and Cleveland, attended as a delegate from his section.

**A. M. Collins Mfg. Co.**

As the "New Friend of Paper," the slogan under which it has been conducting its business, the A. M. Collins Manufacturing Company, of Philadelphia, made its Laidtone, Laidmark, Laidtone Translucent, and the recently added modern colored grades of the Translucent the feature of large exhibition with a corps of representatives of the various departments in attendance. Under the advertising manager, Herbert F. Foster, H. W. Kramer, manager of the card board and cover lines, and H. H. Tunstall, manager of the covers for box makers and book papers, the display was the center of attraction for large numbers of visitors. The unique line was developed into a very modern display. Two new cover papers that just have been added were shown in the Old Spanish and Javanese marks while a new line that has been added in the Laidtone Letter Duplex was an especially featured number. Other displays were made by local representatives of the Collins lines among Philadelphia distributors.

**Louis Dejonge & Co.**

An educational exhibit on coated papers was made the theme of the display through "Uncoated Facts On Coated Papers," which demonstrated the Louis Dejonge & Co. printed grades of papers. The firm made this subject its special topic for the executives of printing, advertising and consumer corporations who were interested in the actual cost on certain direct mail matter. The exhibit was held in conjunction with the local distributors, the Bentley Paper Company, of Philadelphia, which recently was organized to handle the Dejonge line of printing papers separately from the box makers grades which have long been marked by the concern.

**Dill & Collins Co.**

While the Dill and Collins Company occupied a large booth with a series of portfolios containing a larger assortment of direct mail matter on the Dilco line of papers and actual printed pieces sent out by the local manufacturers within recent times, an important newly added grade—the PrintfleX—was made the main object of interest in direct mail folders. This new paper of the century old Dill and Collins Company, of Philadelphia, is produced in varied sizes and weights and is an economical folding coated paper. It is not to be confused with Dilco, which has long been marketed by the company. It is excellently adapted for clear and effective illustrations such as are conveyed in mail matter where rough usage is entailed in transportation, and where durability is an asset. Those who were at the booth for the convention were Secretary W. H. Lloyd, Advertising Manager W. R. Kornkamp, and Sales Promotion Representative M. B. McQuade. Other grades of papers made by the Dill and Collins Company were shown by several of leading fine paper houses of Philadelphia and included the De and Se Tint Announcements, programs, folders, envelope stuffers, catalog inserts and catalogs, brochures and other lines of the Diamond D Mark.

**W. C. Hamilton & Sons**

Commemorating the 75th anniversary of the founding of the firm, W. C. Hamilton and Sons, of Miquen, near Philadelphia, gave special attention to the decorative scheme of its exhibit and produced an effective setting for the line of Hamilton Made Papers. Having been born and reared beneath the Shrine of Liberty, the Hamilton Company celebrated its 75th milestone with an appropriate souvenir, a reprint of the Declaration of Independence on Hamilton Bond, which it distributed by the thousands to visitors. The booth in charge of Sales Manager Joseph Dutton showed a wide range of recently developed Hamilton Papers and the old established lines that are nationally known. Italian pressed deckled edge follows the style of papers made from the early traditions of paper manufacture under the banner of Italy and gave to the consumer a new vista of colors in artistic printing in book weight, cover weight and card weight papers. Laimark was another Hamilton grade in deckled edge papers for a wide range of uses and is produced under the same classification of weights in delicate pastel shades adapted for use in business cards, announcements, booklets, folders, menus and other printed matter. A most attractive piece of the decorative art of the lithographer was a large panel resembling a replica of old tapestry which was hardly discernable from real cloth work. It was a large tri-folding panel made of Hamilton Offset and produced under the artistry of the Schmitz Hernig Litho Company with fourteen different colors on black background that resembled velvet, with hand embroidered and woven designs.

**Standard Paper Mfg. Co.**

With an additional two colors to its line of Two Text Bonds and a wide range of blotting papers, the Standard Paper Manufacturing Company, Richmond, Va., gave prominence to the local distribution houses along with its own factory booth under Sales Promotion Manager J. G. Sutton of the company. There was on display in the factory booth a complete assortment of the Two Text Bonds in five colors and white, with two new shades of rose and golden rod, added recently, also included. The D. L. Ward Company, Molten Paper Company, Satterthwaite-Cobaugh Company, and the Charles Beck Company, gave the Standard Line a share of their displays as local distributors of the blotters, while the Satterthwaite-Cobaugh Company and Thomas W. Price Company showed the Two Text Bonds. Handy little pocket memos in leather were distributed to the visitors to the Standard booth.

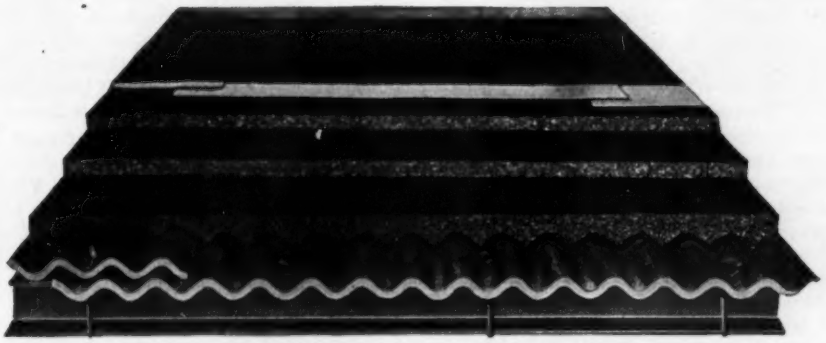
**Kalamazoo Vegetable Parchment Co.**

A complete three reel moving picture of the manufacture of the Kalamazoo Vegetable Parchments were shown by the local sales manager, Clyde B. Kelley, in conjunction with the exhibit of the Satterthwaite-Cobaugh Company, Quaker City distributors of the K. V. P. lines. The three reels took the conventionites in an airplane journey to the mills at Kalamazoo, Mich., and they made the rounds of the manufacture of the parchments from the preparation of the raw materials, through the cutting, sorting, packing, cleansing and pulp processes before they arrived in the beaters and then were made into paper and rolled through the machinery and finally finished and ready for shipment. The plant shown in its entirety involved an equipment of $850,000,000, inclusive of buildings.

**The Wrenn Paper Co.**

With a quip on the recently exposed Philadelphia oases The Wrenn Paper Company, Middletown, Ohio, came to the forefront ranks of humor at the convention in its distribution of Wrenn's

# This Rot-Proof Construction Saves Money by insuring *Permanence without Maintenance*



*Section of Johns-Manville Insulated Rot-proof Roof (patented). Note the lower surface which is made of the famous Johns-Manville corrugated Transite, a fireproof, rot-proof, asbestos "lumber". Above this is a cork mastic fill and required thickness of sheet cork topped by a built-up roof of asbestos felt and asphalt. The heat lost through this roof is less than one-third that through wood of equal thickness, and this value is maintained.*

# J-M Insulated Rot-Proof Roofs

## *are impervious to moisture from within and without*

EVERY paper manufacturer knows how trying the mill conditions are on roof construction. To meet these conditions we invented the Johns-Manville Insulated Rot-proof Roof, which possesses unique features that result in cash savings wherever it is used.

## *Consider These Advantages*

1 The Johns-Manville Insulated Rot-proof Roof is permanently water-proof on both sides. It is unaffected by the hot vapor in the mill, as well as outside weather conditions.

2 The Johns-Manville Insulated Rot-proof Roof is scientifically insulated to prevent condensation on its under surface, thus greatly reducing or eliminating entirely the necessity for special heating or ventilating systems.

3 Thickness for thickness the J-M Insulated Rot-proof Roof has more insulating value than any other roof construction. Reduced winter heating costs and improved working conditions are direct results.

4 J-M Insulated Rot-proof Roof, because of its asbestos composition, is FIREPROOF, ROT-PROOF AND RUST-PROOF. It is unaffected by acid fumes and requires no maintenance.

5 J-M Insulated Rot-proof Roof can be applied quickly, in summer or winter. Precautions against frost or delays while the roof slab is "curing" are eliminated.

6 In addition to its qualifications as a material, J-M Insulated Rot-proof Roof is so secured to the steel work that both are allowed to move, one independent of the other. Hence, we have a floating roof construction which does not permit transmission of movement through the slab. One of our roofs of this type, containing three and one-half acres without an expansion joint, was installed two years ago and remains today in perfect condition.

We invite inquiries about J-M Insulated Rot-proof Roofs. *Address Paper and Lumber Industry Section, Johns-Manville Corporation, at New York, Chicago, Cleveland or San Francisco.*

MASTER *of* ASBESTOS

**Johns-Manville**

**INSULATED ROT-PROOF ROOF**

Blotting, showing a Colonial messenger racing towards Independence Hall with a blotter in his hand, while surmounting the scene of the Independence Square was the title "Drying Up Philadelphia." This was accompanied by statistics showing that every man, woman and child in the City of Brotherly Love used on an average of one square foot of Wrenn's Blottings through the Garrett Buchanan Company, the local paper house distributors. Other wet topics on Philadelphia disclosed the fact that if joined end to end they would cover 390 miles and absorb 37,500 gallons of water. A line of attractive colors and printed specimens of blotters were shown along with the much sought quip imprinted sampler blotters of Porcelain Mark.

**S. D. Warren Co.**

With E. L. Johnson, advertising manager of the Boston office of the S. D. Warren Company, supervising the booth of that manufacturer, the local paper houses handling the Warren line, the D. L. Ward Company and the Charles Beck Paper Company, shared in the educational campaign conducted in the booth of that mill. The booth was given entirely to the educational books distributed by the company to printers and advertising concerns. There were 23 pieces on exhibit besides direct mail booklets and samplers with an interesting series of view post cards of sight seeing places in the Quaker City which were at the disposal of guests to the booth to be sent to the folks back home. E. P. Joseph represented the Beck Company and Thomas J. Curry the D. L. Ward Company.

**Waterfalls Paper Mills**

While the Waterfalls Paper Mills, of Mechanic Falls, Me., gave a general display of the Waterfalls Bonds and Ledgers, there was a particularly interesting new assortment of the D. A. Envelopes, in ten sizes of white, for the usual broadside forms which are distributed in the City of Brotherly Love by the Charles Beck Paper Company and Raymond-McNutt Company. In the Waterfalls group was an unusual sheet in Waterfalls Platefold for illustrated catalogues, steamship folders, book jackets, poster broadsides, maps, looseleaf products and calendars, and a recently developed paper. It has a high surface; is a folding non-coated product remarkable for clear illustrating and strength as well as durability. These papers were shown to the trade by Godfrey M. James, of the mill sales staff.

**Reading Paper Mills—Paper House of Pennsylvania**

An extensive assortment of the various colors and grades of papers made by the Reading Paper Mills were featured in the exhibits of the Paper House of Pennsylvania. With printed specimens of the Louvain, Bodleian and Kinkora covers and book papers, the line was high lighted along with the Strathmore, P. H. Glatfelter Company's Provenworth, Gilbert Paper Company, Knowlton Brothers Paper Company, Chemical Paper Company, Eastern Manufacturing Company, Champion and Crocker-McElwain Company's products. The Print Shop of the Future was an interesting topic that was exploited at the Paper House of Pennsylvania booth, where Norbert A. Considine, president of the company, presided, with Miss Catherine A. Wood, secretary of the firm. This subject treated in humorous vein, showed the high power speed and automatic conduct of a printing plant fifty years from now.

**United States Envelope Co.**

Surrounded by a stage setting of rich black velvet hangings, the headquarters of the United States Envelope Company, occupying considerable space, was given over to attractively mounted assortments of envelopes manufactured by that corporation. Robert T. Day, advertising manager of the firm, was in attendance and distributed the informative and useful booklet on Postal Rates and Regulations compiled by the firm as of August 1, 1928, with another interesting topic in booklet form on the History of the Envelope.

**MacLaurin Jones Co.**

Centering its exhibit around the Waregold and Wareplatinum and Glassad window pasters, the McLaurin Jones Company booth was brilliantly illuminated with glittering products that were decidedly effective under the lights of the convention quarters. The firm's booth was decorated profusely with the illuminative papers, with imprints of famous classical subjects and the gold paper mounted photos of the presidential candidates, Hoover and Smith. The booth had a continuous run on the resources for the presidential nominees, distributing more than 15,000 copies to the visitors. Those who represented the mills at the booth were Henry Donahu, sales manager of the gummed and gold paper departments; P. W. Robinson, advertising manager; W. D. Robertson, southern sales representative, and J. S. Montgomery, manager of the New York headquarters. John MacLaurin, treasurer of the company, journeyed here from the mills with the head of the firm, President William McLaurin.

**Hammermill Paper Co.—T. W. Price Co.**

With a joint display of the products of the Hammermill Paper Company, Erie, Pa., and that of the Thomas W. Price Company, a Philadelphia distributor, a wide range of colorful printing papers adapted for direct mail purposes were shown. They included the Hammermill bonds, book papers and covers. The Price Company also displayed Kroyden covers, made by the Holyoke Card and Paper Company, Holyoke, Mass.; Dill and Collins Company; Roxburghe covers of the Worthy Paper Company, Crocker-McElwain Company lines and gum paper made by the Mid-States Gummed Paper Company, Chicago, Ill., and 43 other makes of papers, with Reuben Levick and Fred Dubbs in direction.

**Chicago Paper Co.—A. Hartung Inc.**

With a special arrangement of the printed matter showing actual mail pieces and other ad material, the Chicago Paper Company displayed its Foldwell coated papers, distributed here by A. Hartung, Inc. James L. Smith, sales and advertising manager, was in personal attendance throughout the convention, while Edward and Richard Hartung, brother associates, joined in the extension of welcome to trade visitors.

**Curtis & Bros.**

A. Hartung, Inc., also displayed the complete line of papers made by the Newark, Del., mills of Curtis & Bros., which has just been added to the firm's distributive products. With the transfer of the lines to the Hartung Company, Curtis & Bros. will retire from the retail field in Philadelphia, its only retail outlet, and confine its production to the distributors throughout the country. This new feature of the Hartung business was effective this week.

**District of Columbia Paper Co.**

With the Whiting Patterson Company, of Philadelphia, featuring the displays of the District of Columbia Paper Company, there was shown a most colorful line of papers and blotters made by the manufacturers in the Nation's Capital. The line was brilliant and colorful and presented many beautiful cover designs and colors as well as bonds and ledgers and the newest Floradeco blottings.

**Whiting Patterson Co.—German Papers**

One of the most beautiful assortments of hand stenciled imported papers from Germany was shown by the Whiting-Patterson Paper Company, of Philadelphia, which have just been added to the stocks of the firm. For several years the firm has handled English papers, but the foreign line has now been extended to German manufacturers. The colors and designs are modernistic but rich in technique of combinations and artistry for cover papers. The firm is featuring the Teko Sample Book, which takes in the line of modern papers. The booth was directed by General Sales Manager Leo F. Supple.

**George W. Wheelright Co.**

Combining the exhibits of the George W. Wheelwright Company, Leominster, Mass., with other grades carried by the local distributors, the Satterthwaite-Cobaugh Company, the newest additions to the Wheelwright line, the cover papers to match the B. P. F. brands, were prominently featured. These papers were recently announced by Otto W. Renner, manager of the Wheel-

Peck Carrier

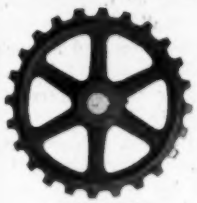
SS-850 Chain for suspending and operating barking drums

"C" Class Combination Chain

"400" Class Chain

"RC" Class Chain for power transmission

Belt Conveyor



>FLINT-RIM< Sprocket

Gears of all kinds

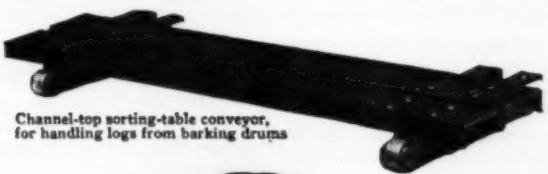
# Everything for Handling Materials, and Driving Machinery

EVERY mill should use the new 1088-page Link-Belt General Pricelist Catalog 500, which completely covers in list prices and descriptions, the machinery equipment to keep the mill going. Address the nearest office listed below.

"S" Spur attachment

Friction Clutch

Plain Bearing



Channel-top sorting-table conveyor, for handling logs from barking drums

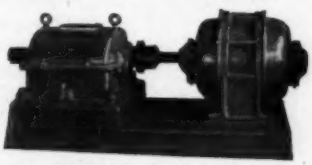
Malleable Iron Safety Collar

>HEXTOP-< Grease Cup

Link-Belt Silent Chain Drive

Style "DS" Take-up

Link-Belt Crawler



Link-Belt Herringbone Speed Reducer (Sykes tooth form)

Chain Conveyor handling logs

LINK-BELT COMPANY

Leading Manufacturers of Elevating, Conveying, and Power Transmission Chains and Machinery

3496

CHICAGO, 300 W. Pershing Road
Ashland, Ky. Atlanta Baltimore Birmingham Boston Buffalo Cleveland Dallas Denver Detroit Huntington, W.Va. Kansas City, Mo. Los Angeles Louisville Milwaukee Minneapolis Montreal New Orleans New York Oakland Pittsburgh Portland, Ore. San Francisco Seattle St. Louis Toronto Utica, N. Y. Wilkes-Barre

INDIANAPOLIS, 200 S. Belmont Ave.

PHILADELPHIA, 2045 W. Hunting Park Ave.

# LINK-BELT

wright Company here, and attracted a larger following who were interested in the latest addition. The Corinthian covers, as they are known, are in seven attractive cover colors and white and match the same numbers of shades in the B. P. F. leaflets for the inner section of books, folders or announcements. The Satterthwaite-Cobaugh Company also featured the K. V. P. bonds and ledgers; Collins Manufacturing Company, bonds; and ledgers and standard blotters.

### Garrett-Buchanan Co. Shows Centennial Register

The magnet which held crowds at the exhibit made by the Garrett-Buchanan Company, of Philadelphia, was the perfectly preserved official visitors' register made famous at the Centennial Celebration fifty years ago. The Register contains the names of famous persons, such as U. S. Grant, Brigham Young and "Wives," and Dom Pedro, of Brazil, and a host of others famous in the world's history. The Register is perfectly preserved, legible, and clear as the day that the names were signed, despite aging of the ink. The leaves on which the names are written are of Byron Weston Ledger and the Register now is owned by Byron Weston Company, of Dalton, Mass., which loaned it to the convention. Harry Sloane and H. Conradi supervised the exhibits, which included Heard bonds, Eagle A papers and many other nationally known makes.

## Philadelphia Paper Market Active

PHILADELPHIA, Pa., October 22, 1928.—As the paper trade joins in the upward swing of industrial activity that looms on the autumn horizon, there is a brighter attitude taken for the remainder of the year's demand. Though fine paper dealers are less inclined to the active side that has been notable in the wrapping paper division there nevertheless is an improved market for smaller lot shipments.

Continued warm weather has created a prolonged activity in the many lines that normally are summer sellers such as sanitary products in drinking cups, towels, napkins and other products. The briskness of the late summer continues to keep this division of the trade alert and shipping departments are kept at a fair rate of service meeting the unusual autumn needs.

While wrapping paper dealers are growing more active the fine paper group gradually improves. The past week gave the dealers many opportunities to secure good orders from visiting advertising men who attended the Direct Mail Convention or to lay the foundation for future business from this source. The paper trade was alert to the opportunities for exploiting their wares and mill men and distributors joined in making the convention paper displays the best and most extensive ever shown in Philadelphia.

## Changes in Transportation for Paper Mills

GLENS FALLS, N. Y., October 15, 1928.—An example of the change in transportation conditions as affecting paper mills may be found here. The feeder canal between this city and Fort Edward was formerly one of the principal arteries of transportation for paper concerns in the Glens Falls area. Forty years ago more than 100 boats were plying the feeder canal carrying all kinds of paper mill supplies, fuel, lumber, etc. During the past season one lonely barge, the *W. E. Boise*, owned by Finch, Pruyn & Co., of this city, has been using the canal. The barge has been engaged during the summer in carrying paper to New York City and coal on the return trip.

Complete suspension of navigation on the feeder is seen in the near future as Finch, Pruyn & Co., it is said, will scrap the remaining barge of the once numerous Finch, Pruyn fleet when it has outlived its usefulness. While Finch, Pruyn & Co. continue to use the water route in shipping the product of the Glens Falls mills the bulk of the output is moved by motor transport to Fort Edward and loaded on the barges at that place. The barges plying in the Champlain Canal cannot use the feeder canal because of their size.

## Shaffer Box Co. Builds Sulphite Mill

The Shaffer Box Company of Tacoma, Wash., an old established enterprise, having an annual cut of approximately 40 million feet of hemlock and spruce started construction of a 50 ton sulphite mill in April this year to operate in conjunction with its present plant. The company has an economic basis for its undertaking in that the two plants can be operated together with a minimum of waste. In the present operation of sawmill and box factory there is of necessity a large costly waste. The plant also has an ideal location for securing at a minimum such essentials as wood, power, transportation, water, limerock and sulphur. The plant is also located within a few hundred feet of the new chemical plants being built in Tacoma by the Pennsylvania Salt Company and the Hooker Chemical Company.

The company's pulp plant was designed by L. A. DeGuere of Wisconsin and his organization is personally following the construction. The plant is located on deep water and has shipping connections with all parts of the world, Tacoma being port of call of 55 steamship lines. The company has 21 acres of land and the plant is designed for not only increasing the pulp output but also a possible paper mill extension. The acid system, installed by G. D. Jenssen Company, has tower capacity for 100 tons. The two digesters 16x51 built by Willamette Iron and Steel Company have a potential capacity of 56 tons. The wet screens manufactured by the Smith Valley Iron Works are twenty 12 plate screen. They are also furnishing 51 inch chippers. The dryers are furnished by the Technical Economist Corporation and manufactured by Proctor Schwartz.

The chip screens are the Digester Machine Company type. Doran & Company are supplying the bronze valves and fittings. An Impco knotter is being installed and a Woods thickener. The wet machine is the Kamyr (94 inch) from Sweden.

The company is making every effort to install throughout high class equipment and the plant is expected to be a very efficient unit.

## Jaite Co. Builds Bag Factory at St. Helens

Twenty three years ago, at Jaite, Ohio, The Jaite Company, headed by C. H. Jaite, began the manufacture of paper and paper bags for the cement, plaster and kindred industries. A pioneer in the manufacture of valve paper bags, every passing year has witnessed additions to their plant and manufacturing facilities until now, many acres of productive property is utilized in the making of Jaite paper bags.

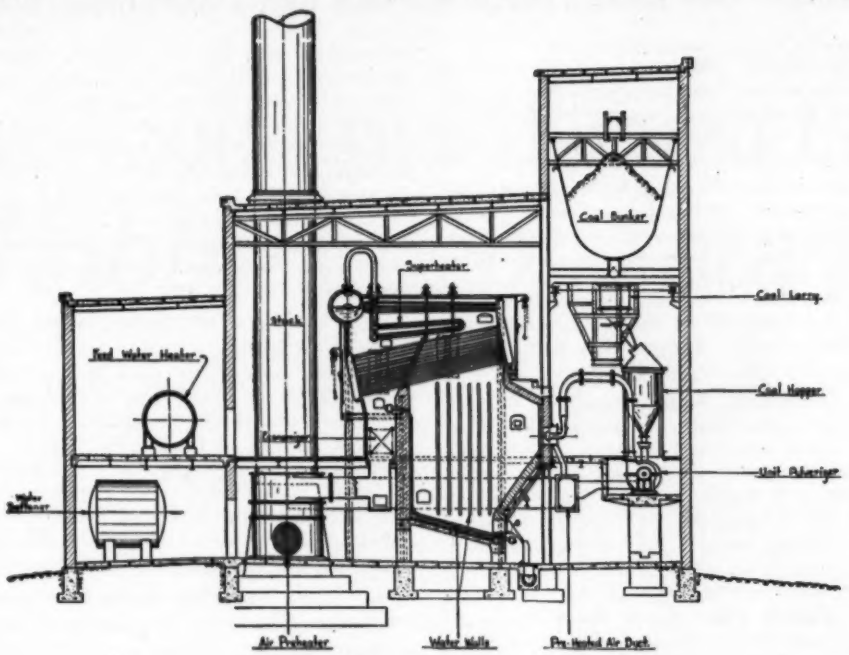
The year 1928, The Jaite Company, better to provide for the increasing demands of cement and plaster trade, completed a paper bag factory on the Pacific Coast and on July 1 the first carload of Jaite Pacific Coast bags were shipped from St. Helens, Ore.

St. Helens is a manufacturing city on the Columbia River, thirty miles from Portland. It is ideally situated from the standpoint of paper manufacturing, having timberland where domestic wood is obtained from which the paper pulp is made, deep water frontage and rail connections to all points and enjoying exceptionally good shipping facilities. At this point and adjoining the plant of the St. Helens Pulp and Paper Company is located the Pacific Coast factory of the Jaite Company.

During the spring of 1928 equipment was installed giving the St. Helens plant a daily capacity of a carload cement or plaster bags. In September additional equipment was installed increasing production of the sewed type bag and also making possible, the manufacture of the heavy Jaite single and double wall pasted bag.

The St. Helens plant, while in position to ship to Gulf and Atlantic ports because of deep water facilities on the Columbia River, was built primarily to take care of the Pacific Coast and Rocky Mountain territory, and in this respect is admirably situated.

# More EDGE MOOR CROSS DRUM BOILERS for West Virginia Pulp & Paper Company




## Two 825 B.H.P. units for 425 lbs. pressure—18TH Order

THE West Virginia Pulp & Paper Company's eighteenth order for Edge Moor Boilers covers two cross drum units of 825 B.H.P. each, built for 425 lbs. working pressure, for installation in the Covington, Va., plant. This is practically a duplicate of their seventeenth order, dated August, 1926.

The new boilers for Covington will be equipped with water walls of the bare tube type, also designed and built by Edge Moor. These will be connected directly into the boiler circulation.

The boilers are of two-pass type, with superheaters, economizers and air preheaters, and equipped for pulverized coal firing.

The West Virginia Pulp & Paper Company's experience with Edge Moor Boilers dates back to 1899, since which time they have bought fifty-six units totaling 34,041 B.H.P. for service in their plants at Covington, Va.; Piedmont, W. Va.; Mechanicsville, N.Y., and Tyrone, Pa.

Convincing proof of Edge Moor service is contained in this thirty-year record of "repeat orders." The same service is available to every steam plant.

EDGE MOOR IRON COMPANY
*Established 1868*
EDGE MOOR, DELAWARE
New York Chicago St. Paul Los Angeles Charlotte

EDGE MOOR BOILERS EDGE MOOR, DEL. U.S.A.

EDGE MOOR
Water Tube BOILERS
STRAIGHT AND BENT TUBE TYPES—WATER WALLS—AIR PREHEATERS

# New Sluiceways Completed for Fox River Dam

## Fourteen Steel Gates Installed Between Concrete Piers Will be Operated by Portable Electric Motor—Dam is One of Widest on Fox River, the Heart of the Wisconsin Paper Mill Industry—New Bleach Plant at Wisconsin Rapids Nears Completion

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 22, 1928.—New sluiceways for the large Fox River Dam at DePere, Wis., have been completed after five months of work by a crew of about forty men employed by the United States engineering department. Next year new spillways of concrete will be built at each side, converting an old wooden dam with "needle" gates in use for many years to a modern concrete dam. This year's work represented an expenditure of $80,000, and next season's improvements will cost $125,000. Fourteen steel gates have been installed between concrete piers. They will be operated by a portable electric motor so they can be opened and closed individually. There will be no gates on the spillways. This dam is one of the widest on the Fox River, which is the heart of the paper mill industry. The sluiceway section is 350 feet long and represents only the center of the dam.

### New Consolidated Bleach Plant

Excellent progress is reported on the new bleach plant for the Consolidated Water Power and Paper Company, at Wisconsin Rapids, Wis. The foundations are finished and a large part of the steel work is in place. A distributing tower has been put up and concrete is being poured rapidly for the remaining side walls. The company's new finishing room is also nearing completion. Workmen are now bricking in the side walls and it will be under roof by the time more severe weather begins.

### Interlake Digester Plant Nearly Ready

The Interlake Pulp and Paper Company, of Appleton, Wis., subsidiary of the Consolidated Water Power and Paper Company, is looking forward to the day when its new digester plant will start operations. Special training classes are being held daily for the entire crew of this department so the change can be made without any loss of production.

Nine digesters will take the place of the old ones in use for 35 years to produce Mitscherlich sulphite pulp. The new ones are of one and one-eighth inch flange steel plates, fourteen feet inside diameter and forty feet long. Heavy box beam girders support the expansion roller block, steel cradles and the entire digester load of about 350 tons each.

About 700 feet of copper tubing placed within each digester, furnishes the indirect heating. The cooks will have close control of the cooking because all controls for each of the nine units are located on the operating ends. These consist of steam valves, relief and blow off valve controls, hydraulic operated cover hoists, steam traps and recording instruments.

Chip bins above each digester will hold sixty cords of chips. The stock pits directly under each shell will hold two cooks or 28 tons of pulp. Drainer bottoms in the blow pits are guarded by save-alls to prevent any stock loss. A double centrifugal pump, arranged to operate either in parallel or in tandem, will furnish both high and low pressure water for the Mitscherlich cooling system. Hydraulic valves operated from the main floor will control the draining of blow pits and stock sluice ways. The entire water piping system is of copper, so as to prevent slime and dirty water.

A bucket belt elevator ninety feet high will convey chips to a thirty inch belt which distributes chips the entire length of the building. A large electric elevator also is being installed giving convenient access to all floors.

### Safety School Session Well Attended

An attendance of 425 at the opening session of the safety school conducted at Menasha, Wis., last week was more than a surprise to the paper mills and other industries sponsoring the school in co-operation with the Menasha vocational school. Those present were superintendents, foremen, nurses, safety workers, department executives and others.

L. Sagemueller, manager of the Meteor Oil Company, Milwaukee, Wis., gave the opening address on "Safety and Responsibility." He gave emphasis to the power of foremen to prevent accidents.

The next meeting is to be in charge of George Banta, Jr., of the Banta Publishing Company. The speaker will be R. G. Knutson, of the Wisconsin Industrial Commission. His subject will be "The Success of Safety."

### More Foremanship Classes Planned

The rapidly growing movement for foremanship classes in Wisconsin paper mills will be aided by a pamphlet which has been prepared by M. W. Smith, who is in charge of these classes in Fox River Valley cities. The booklet is entitled "A Catechism on Foreman Training by Conference Method." It answers all the questions an executive might want to ask before deciding to establish such a class. Cities of the Fox River Valley already have these classes, but the Wisconsin River Valley is also to be included in the program soon. Wausau, Stevens Point, Wisconsin Rapids and Eau Claire are among the latter.

### Rest Day Recommendations

Following a conference last week at Wisconsin Rapids, Wis., the paper mill committee dealing with the problem of one day of rest in seven for employees has prepared recommendations which will be submitted to the Wisconsin Industrial Commission, and probably adopted. Considerable time has been devoted to the problem, because paper mills were unable to comply to the letter with a Wisconsin labor law which would give each man a seventh day of rest.

In the recommendations it is suggested that the commission require one day of rest in every calendar week, instead of every seven consecutive days. Exemptions are requested for superintendents and department heads who do no manual labor, and employees whose duties include no more than three hours of essential work on Sunday, making necessary repairs to boilers, wiring and machinery.

### Members of the Committee

Members of the committee are Walter L. Mead, of the Consolidated Water Power and Paper Company; S. F. Shattuck, of the Kimberly-Clark Corporation, and Henry Ohl, president of the Wisconsin Federation of Labor. In the absence of Mr. Ohl, Congressman George J. Schneider represented the labor group.

### Nekoosa-Edwards Airplane Service

The Nekoosa-Edwards Paper Company, of Port Edwards, Wis., has pioneered by being the first Wisconsin organization to buy and own an aeroplane for company use. With the establishment of a large airport at Wisconsin Rapids, Wis., the company bought a tri-motored Ford monoplane and has engaged a pilot for permanent service.

The plane will carry twelve passengers and will make trips between the mill and Chicago, New York, Cincinnati, Cleveland, St. Louis and Denver. One of the main objects is to convey as many as possible of its 4,500 jobbers' salesmen direct to the mills to become acquainted with company officials and with the manufacture of the products they sell. The plane also will give closer contact with the company's branch offices.

AFAFAFAFAFAFAFAFAFAFAFAFAFAFAF

# ARE YOUR BOARD MACHINE FELTS *Hobbles* *or Spurs* ?

The weave of a felt can speed up or retard production more than any other single element on a board machine. A hair's breadth difference in yarn twist, in strand weight, in tension of warp or woof, may mean the difference between economical production and slow profit-eating output.

Obviously, then, to maintain peak production, the machine must be dressed with felts definitely planned in every detail from raw wool to final shrinking, to do just the job you want them to do...on the machines on which you plan to use them.

With a background of years of experience, Albany designers can plot a weave to achieve specified results; Albany weavers can translate the design into actual fabric; and Albany resources and equipment supply the means to coordinate their efforts. The result..... Albany Tops and Bottoms, *Tailor-Made* to meet the conditions and requirements of the machine for which they are intended.

No *standard* felt can meet *all* the requirements of every machine and every mill. If you have a specific problem....and every board mill problem is specific....tell us the details and let us design and weave Tailor-Made Tops and Bottoms to solve it.

# ALBANY FELTS

TAILOR-MADE BY ALBANY FELT COMPANY, ALBANY, NEW YORK

AFAFAFAFAFAFAFAFAFAFAFAFAFAFAF

# Boston Paper Industry in Fairly Good Position

## Distributors Report Satisfactory Volume of Orders and Anticipate Further Improvement During Balance of Year—Both Fine and Coarse Paper Quotations Continue Steady—Box Board Market Rules Moderately Active—Exposition of Industrial Products

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 22, 1928.—The paper industry here is in at least a fair condition, with some of the dealers reporting a satisfactory volume of orders and indications of further improvement. Prices continue teady. This situation holds good for both fine and kraft papers. The box board market is moderately active, although some dealers complain of poor collections.

All grades of waste paper are firm, with a particularly gratifying demand for write blank news, over issue news and folded news. White blank news has advanced in price, and is now quotable at 1.70 to 1.75, f.o.b. Boston, compared with a previous range of 1.65 to 1.70. The trend of values, if anything, is upward.

A number of the paper manufacturers were exhibitors at the Third Annual Exposition of Industrial Products manufactured by members of Associated Industries of Massachusetts at the Copley-Plaza Hotel, October 16 to 18, inclusive.

### American Writing Paper Exhibit

The American Writing Paper Company, of Holyoke, Mittineague and Huntington, makers of the famous Coupon Bond, depicted a scene in the square ring, after the manner of John Held, Jr., in which "Price" suffered a knockout at the hands of "Quality." The exhibit, entirely of Eagle-A Direct Mail Papers, some fifteen in all, with only a few of the hundreds of available textures and colors represented, demonstrated an effect in color. Samples of the American Embossed Cover were given out in the form of a wallet for keeping memoranda together and clean in the pocket. Richard F. Linsert, of the sales promotion department, was in charge of the exhibit.

### Instructive Joint Demonstration

The joint exhibit of Z. & W. M. Crane, Inc., of Dalton, Mass., and the Eaton, Crane & Pike Co., of Pittsfield, Mass., demonstrated the various operations in the manufacture of their paper from baled rags to the box stationery. In miniature were baled rags, rag dressers, bleach boiler, half-stock beater, dry loft, and plater showing method of finishing. A picture of the paper machine was also shown. The water mark display was that of Z. & W. M. Crane. The exhibit included also some novel boxes, among them the silk covered desk box, Crane's Fern Brook, which is their newest paper, novelty place cards, informal notes, visiting cards, wedding sheets and envelopes. A desk book, "The Etiquette of Letter Writing," was given to visitors to the exhibit.

### All Strathmore Lines Displayed

The Strathmore Paper Company, of Mittineague and Woronoco, showed practically all lines produced by this concern and how Massachusetts advertisers use its papers. The display emphasized the use of bright colors in advertising, and also included a book which showed new features in paper and the slogan, "Sell More with Strathmore." Very attractive books and samples of Strathmore Paper were given out. The exhibit was in charge of Ebbert M. Hughes, sales promotion manager.

### Crinoline Super Plate Featured

The Tileston & Hollingsworth Company, Boston, whose factory is at Hyde Park, featured a Crinoline Super Plate and in it a beautiful sheet of a brilliant while color and finish adapted to delicate half-tone, although uncoated. A help in selling this paper is the fact that it is uncoated and thereby has very good folding qualities, making it adaptable to all kinds of mail orders. The booth carries out the atmosphere of old-fashioned quality and at the same time shows the splendid work of Arthur V. Howland, vice president of the company, in aggressiveness, progress, and prosperity. Samples of Athena Plate and Milton Line were distributed. During the late afternoon and evening a Crinoline Girl entertained with the melodeon and old-fashioned songs. The booth, which was designed, laid out and decorated by Howard Wallingford, was in charge of Arnold Jenkins, Ward Harper, Manfred Perry, and Charles Trefrey.

### Wheelwright Booklets Exhibited

The Geo. W. Wheelwright Paper Company, makers of B. P. F. Book and Dove Mill Bristols, Leominster, Mass., showed booklets, etc., made of paper manufactured by the company.

### Hoover-Curtis Parade Plans

The second meeting of the Paper Trade Division of the Hoover and Curtis torch-light procession was held today at the Boston Chamber of Commerce to hear reports of the committee and make final plans for the parade, which will take place November 2.

The division is to form at Winthrop square, Devonshire street, at 5:45 p. m., and headed by a 25-piece band, will proceed at 6:15 to the starting point on Commonwealth avenue, approximately at Dartmouth street.

The committee of the Paper Trade Division is composed of Walter M. Pratt, chairman, George D. Allen, Floyd Blackman, Edward D. Dement, J. H. Brewer, Charles T. Dole, J. C. De Coster, C. L. Dodge, Howard Emerson, A. V. Howland, Roger S. Hubbard, F. H. Keep, Frank H. Merrill, W. J. McLellan, Waldo E. Pratt, Charles A. Proctor, T. C. Walsh, H. R. Woodward, and F. Bendel Tracy.

The costumes committee consists of Floyd Blackman, Frank H. Merrill, and Howard Wallingford. The transparencies are in charge of George D. Allen and torches in charge of R. S. Hubbard.

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## Eaton Paper Co. Improves Mill

On April 20, 1928, the court approved the purchase by the Eaton Paper Company at receiver's sale of the Berkshire Hills Paper Company plant at Zylonite, Mass., located 2 miles from Adams and 4 miles from North Adams, Mass. The mill had been closed down in November, 1927, and merely enough steam pressure maintained during the winter to keep things from freezing and to run a fire pump in case of necessity.

Large repairs were necessary before the plant could be put into operation. These included a new 7-inch 3-ply main driving belt with tightener, new high pressure cylinder in the 1250 hp. Cross Compound Hamilton Croliss Engine, new roof deck on one half of the machine room, and entire beater room.

Practically every roof on the building needed some repairs; all of the new roofs laid were of the Johns-Manville smooth type.

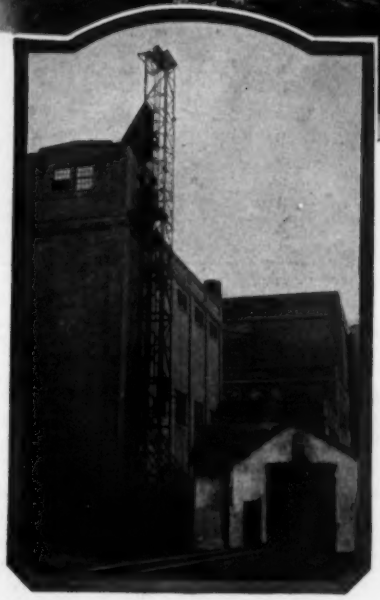
In the machine room the plunger stock pumps were replaced by centrifugals and a save-all system was installed on both machines.

The boiler room contained five Dillon H. R. T. boilers, two of which were condemned and the settings of all were unsafe for operation. All of the settings were removed. Three of the boilers with one new one were reset in batteries of two each, allowing passage all around, and the furnaces were increased in height. This raising of the boilers required the roof of the boiler house to be raised together with the flue.

No. 2 machine was started on Monday, June 4, and the No. 1 machine on Monday, July 9. The No. 2 machine is producing machine dried papers and the No. 1 machine loft dried paper.

Practically all of the paper produced is piled on lift truck skids, wrapped and shipped on skids by 5-ton trucks to Pittsfield.

# Beaumont Skip Hoists for economical, efficient coal handling



Ste. Anne Paper Co. is one of 24 Beaumont Skip Hoist Installations in pulp and paper mills throughout United States and Canada.

## *at the Ste. Anne Paper Co.*

**Simplicity of design and operation mark the features of this coal handling installation. Coal is discharged from cars into a track hopper; fed to the Skip Bucket by the Beaumont patented Simplex Loader. Coal is elevated, discharged to Tram Car which distributes the coal evenly *and automatically* into the suspension bunker. No attention is necessary. The cycle is continued surely, efficiently and quietly until operator pushes the "stop" button.**

**Whether your problem involves handling 20 or 600 tons per hour there is a size and type Beaumont Skip Hoist that will effect real and definite economies.**

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# Power Plant Section

## Reducing Power Costs Through Unit Treatment

Conducted by REGINALD TRAUTSCHOLD, Consulting Engineer

# Modernizing the Mill and Power Plant

### Some Anti-Friction Bearing Dividends

Capital investment for the modernizing of the mill and power plant to cut production costs is justified only when it can be profitably employed. This is not quite as bromidic as it may sound, for there are instances when the installation of additional apparatus, for example, or more efficient equipment of some kind might show a considerable saving on equipment costs if made in a poorly operated mill, whereas, if the mill were operated up to its highest attainable efficiency it would be exceedingly difficult to justify the investment. The first requisite for the betterment of mill operation, then, is to obtain the maximum results from the existing equipment before any considerable expenditure is undertaken for improvements, except, of course, when it is self-evident that capital expenditure is the best method to cure a trouble and at the same time yield a satisfactory return on the investment.

To obtain the maximum results from the existing equipment, there are two outstanding essentials, particularly in pulp and paper mill operations, the elimination of all preventable steam losses and the avoidance of all unnecessary consumption of power. It has become quite customary to refer to these two essentials in

*Courtesy: S. K. F. Industries, Inc.*

FIG. 1

**Anti-friction bearing pulp grinder increases output 13.8 per cent. International Paper Co.**

the embracing term of "heat balance," the very proper aim of every progressive establishment being to set-up the most sensitive heat balance it can develop. Unquestionably, a good heat balance is an index to the efficiency with which the plant is operated. It reflects the economy with which the steam is employed in all process operations and by conversion is a measure of the efficiency with which mechanical power is utilized. It is a combination measure, however, indicating what may very well be termed the "steam balance" and the "power balance," the one a thermal measure and the other a kinetic, or mechanical, measure.

Looking at the heat balance as incorporating two such major factors, it is obvious that any betterment of the steam balance entails greater efficiency in the utilization of steam in thermal processes, the elimination of steam wastes, etc., and that any betterment in power balance entails the elimination of preventable power losses, or wastages. The improvement either in steam balance or power balance affects directly the heat balance, registers a

*Courtesy: S. K. F. Industries, Inc.*

FIG. 2

**96-inch Murray wood chipper equipped with anti-friction bearings cuts power consumption 30 to 50 per cent and lubrication expenses 80 per cent.**

definite cut in production costs, and this irrespective of the degree of efficiency attained in mill operation. In other words, betterments in "steam balance" and in "power balance" are always profitable and any relatively minor capital expenditures entailed are well justified, yielding highly satisfactory returns. There is no need to defer progress in arresting steam wastes or in getting the utmost out of each turnover of the prime movers to learn whether other conditions may so change as to discount any gains which may be so consummated. It is invariably good business to get everything possible from the process steam supply and to employ productively all possible consumed power.

#### Power Balance Betterment

Confining the present discussion to a consideration of power balance betterment, it is a well known fact that one of the major causes, or, if transmission inefficiencies are properly cared for, the chief cause, of power wastage is that of journal friction. This cause of ineffective power consumption cannot be entirely avoided, it is perfectly true, but the journal friction losses can be greatly reduced and are by means of modern anti-friction bearings properly designed, proportioned and installed for the particular service to which they are to be subjected. How much journal friction can be reduced in this way depends largely upon what the journal friction losses are without the refinement of anti-friction bearings, but it has been demonstrated time and time again that suitable and approved ball and roller bearing constructions save about

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**All good belts are made to comply with exacting specifications. But instead of stopping at this point, Condor Belt carries on.**

**Condor Belt is steeled against Time by the aging qualities of its composing factors.**

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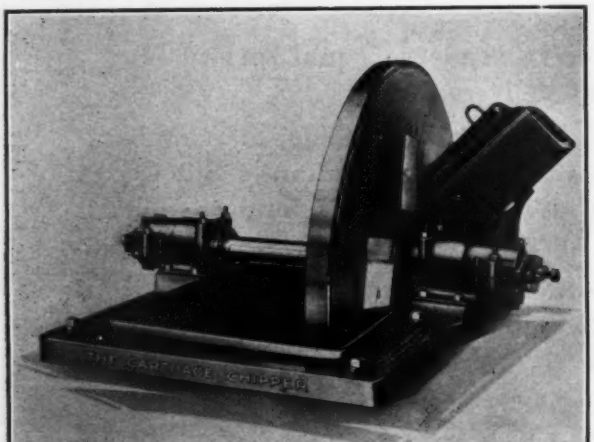
three-quarters of the journal friction loss prior to their installation. If the former losses have been excessive the savings effected by the anti-friction bearings is also substantial, whereas, if the former bearings were relatively efficient the saving is not so marked, though proportionally very nearly the same.

This point is emphasized for the reason that when a number of paper mills were interrogated some eighteen months ago one of the prominent mills which had then recently installed a new Fourdrinier, for the breast rolls of which the builder of the machine had intended supplying anti-friction bearings, advised that the machine in question gave such excellent satisfaction with the breast rolls running in plain bronze bearings that the anti-friction bearings, which were not received until after the paper machine had been set-up and put into operation, were never installed. In view of the inherent superiority of the properly proportioned anti-friction bearing in breast roll service, as elsewhere, this mill has unquestionably paid a premium in the operation of its efficient machine for no other reason than that it must have discounted the known cost of journal friction.

In the search for opinions on the value of anti-friction bearings held by pulp and paper mills known to operate equipment embodying such refinements, quite a number of active mills reported that as the bearings constituted component parts of the machines as installed they were quite unable to supply any information regarding economies such bearings may have effected, expressing without exception, however, complete satisfaction with the bearings. This acceptance of progress in modern pulp and paper mill equipment as a natural and it would almost appear anticipated refinement in paper making machinery is not at all surprising, for it well indicates the present day trend in modernizing the mill and power plant.

Very convincing confirmation of this is shown by the fact that one of the leading manufacturers of anti-friction bearings has recently advised the trades that he now supplies anti-friction bearings for thirty-seven different manufacturers of paper machinery. This does not mean that all the paper machinery built by these thirty-seven manufacturers are furnished with anti-friction bearings, or even that the entire output of machines so equipped which are produced by all or any one of these thirty-seven machine builders supplying equipment to the pulp and paper industries incorporate anti-friction bearings made by the same bearing manufacturer, but it does indicate very conclusively that the value of such bearings is rapidly being recognized by the paper making equipment manufacturers and by the mills they supply.



*Courtesy: S. K. F. Industries, Inc.*

FIG. 3

**Carthage chipper with anti-friction bearings decreases power input 50 per cent, eliminates vibration and with constant operation assured produces chips of uniform size.**

Another well known manufacturer of paper mill equipment is installing another type of anti-friction bearing on an advanced, enclosed type, bevel gear drive which he had brought out. And so on. Numerous such examples of where paper machinery manufacturers have adopted anti-friction bearings for their higher class products could be cited if necessary to demonstrate the value set by such interested parties on the worth of anti-friction bearing equipment refinement to the pulp and paper industries. It goes without saying, however, that the real demand for anti-friction bearing equipped machines comes, or should come, not from the manufacturers of paper making equipment, but rather from the progressive pulp and paper mills.

*Courtesy: S. K. F. Industries, Inc.*

FIG. 4

**Paper Machine line shaft mounted on anti-friction bearings. Fitchburg Paper Co.**

It behooves the dual industries, consequently, to make their bearing requirements known to the equipment manufacturers and this can only be possible when the industries themselves appreciate the savings made possible by the equipment of their machinery with anti-friction journals, whether the service duties entailed are heavy or light. For this reason, also, the balance of this discussion can well be devoted to a consideration of what may be termed anti-friction bearing dividends in specific installations. It is only through the acquiring of information in this way that the progressive mill can demand, rather than simply accept, developments of distinctly money saving possibilities, as far as they influence production costs, by the equipment manufacturers they look to for their essential paper making machinery.

It would also seem proper here to refer back to two discussions on anti-friction bearings which have appeared in these columns, "Anti-Friction Bearing Dividends" in the issue for August 4, 1927, and "Anti-Friction Bearings" in the issue for March 8, 1928, for these presented some very pertinent information concerning demonstrated savings effected through the use of such bearings in specific mill services. A review of these discussions should repay the interested reader and aid him in forming a proper appreciation of the value of anti-friction bearings to the paper making industries, for, while some of the installations featured in these two articles can well serve to provide statistical data for further analyses, the present portrayal of demonstrated anti-friction dividends will be confined in major part to what might be termed heavy duty applications. By this is meant applications in which the journal friction loads demand the provision of anti-friction bearings of an outstanding character.

### Anti-Friction Bearings on Pulp Grinders

Bearings on pulp grinders, for example, are subject to exceedingly severe service, such as continuous duty, heavy loads and contamination of lubicant. In fact, the wearing away of plain

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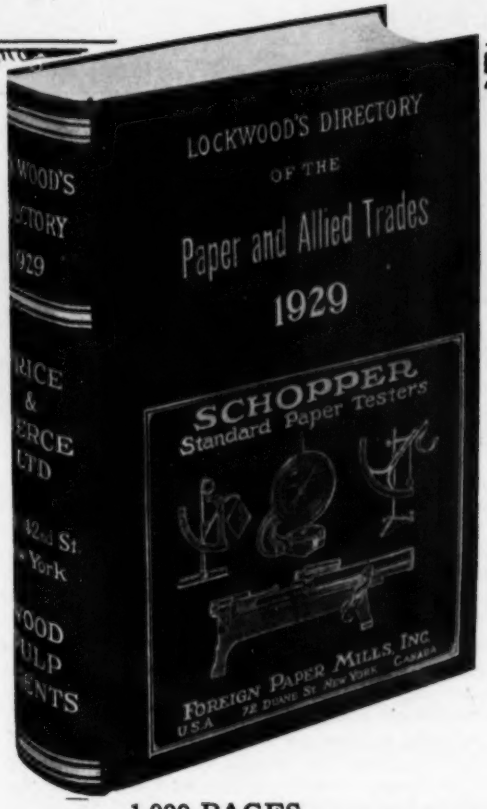


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**New York, N. Y., U. S. A.**

bearings is apt to be very rapid, often amounting to as much as ⅛ inch in six months, making frequent bearing replacement essential, particularly if the freeness of the stock produced is to be kept within desired limits. Consequently, the following records of pulp grinders mounted on anti-friction bearings are of especial interest.

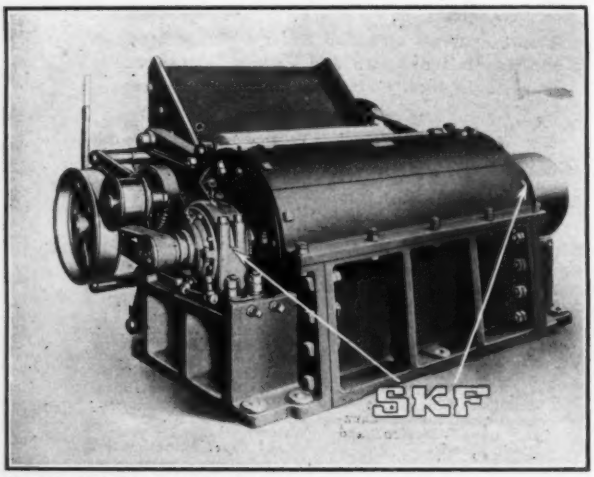
At the Itasca Paper Company tests were conducted over periods of thirty working days on a four pocket pulp grinder furnished first with plain bearings and then with anti-friction bearings, operating conditions being kept as similar as possible. A general summary of the test figures indicates that the anti-friction bearings effected an average reduction in horsepower demand per ton of ground pulp produced of 8.6 per cent. In other words, this means an increased production per horsepower input of 9.4 per cent. Furthermore, the anti-friction bearings showed no signs of wear.

Even bettering this record, has been the experience of the International Paper Company at its Corinth plant where a three pocket grinder equipped with anti-friction bearings shows an output 13.8 per cent greater than that of a similar grinder furnished with plain bearings. The more efficient grinder has now been in 24-hour operation, six days a week, for some two and a half years, during which time bearing maintenance charges have only been nominal, lubrication costs substantially reduced from former values and much better control of product effected.

The weight of the wheel is 3 tons, that of the shaft 1 ton, and the grinder is fed with 2 foot logs 18 inches in diameter, developing a pressure on each bearing of 16,000 pounds. So efficiently does the bearing construction permit the effective utilization of the power input in production grinding that there is only about 20 r.p.m. variation between no load and full load conditions, the normal speed of the grinder being 20 r.p.m. With plain bearings, the speed varied from 185 to 265 r.p.m., a fluctuation of 80 r.p.m.

### Chippers Equipped with Anti-Friction Bearings

Another heavy duty application of anti-friction bearings which appears to withstand the hardest kind of service with marked economy is that which has been so successfully made on wood chipper machines. These machines must stand up in continuous operation, subjected to repeated shock loads, and run for long periods with little attention in an atmosphere laden with wood dust. These are indeed severe operating requirements and conditions, yet at least three makes of approved wood chippers equipped with anti-friction bearings have made enviable records for themselves.



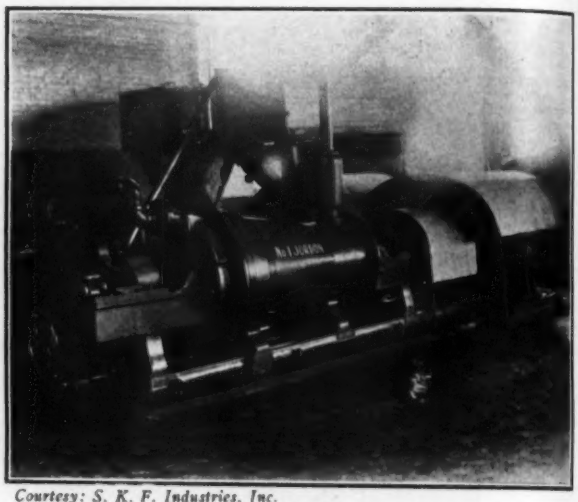

*Courtesy: S. K. F. Industries, Inc.*

FIG. 5

**Waterville Pulp shredder equipped with anti-friction bearings.**

A 96-inch wood chipper built by the D. J. Murray Manufacturing Company has been in operation in Tomahawk, Wis., for about five years, effecting a saving of from 30 to 50 per cent in power consumption and better than 80 per cent in lubrication costs. The chipper makes 800 cuts per minute, 1 inch deep at 45 degrees across grain of a 19-inch diameter log, and produces enough wood chips in sixteen hours to supply the needs of three paper machines on full time production and turning out 200,000 pounds of paper a day.

The Carthage chipper is another of the makes which has for several years been furnished with anti-friction bearings, two at the outboard end nearest the driving pulley and a third near the disc. The manufacturers of this machine adopted the construction for the avowed object of decreasing the power input demand, insuring constant operation and decreasing vibration, etc. All these gains have been realized, the manufacturers claiming that the average horsepower input has been cut 50 per cent., vibration due to looseness of plain bearings eliminated, uniform size of chips produced and constant operation secured.



*Courtesy: S. K. F. Industries, Inc.*

FIG. 6

**Jordan engine on anti-friction bearings yields 95 per cent annual return at the Flambeau Paper Co.**

Appleton chippers are also procurable now equipped with anti-friction bearings and in this connection a survey on the comparable results secured with two such chippers of the same size, one furnished with plain and the other with anti-friction bearings, the Niagara mill of the Kimberly Clark Company at Neenah, Wis., is most pertinent. The report has just appeared. The anti-friction bearing chipper which replaced a similar chipper with plain bearings is an 88-inch machine and has been in operation a little more than two years, nine hours a day, 300 days a year.

The installation was made, after twelve years of experience with chippers mounted on plain bearings, to increase the efficiency of the chipping operation and to reduce to a minimum the chances of shut-downs due to bearing or machine failures. The results can be summed up as an increase in woodroom production of from 30 to 40 per cent., due in large measure to the more steady output secured from the anti-friction bearing mounted equipment, and savings in power and maintenance costs sufficient to cover all carrying charges imposed by the increased cost of the new machine, $1,200.00 for the anti-friction bearing equipment, and leave a net annual saving of $324.30.

A financial balance sheet setting forth the costs of operating both 88-inch chippers with plain and with anti-friction bearings shows that the more efficient machine effected a saving in maintenance expenses of $51.90 a year, a reduction of 53 per cent, and that a reduction in power consumption of 6 per cent was realized. The latter, based on the low valuation of $60.00 a horsepower year, represents an annual saving of $432.00. Against these specific

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economies, the fixed expenses on the added investment represented by the anti-friction bearing equipment, on the $1,200,000, should be charged, *i.e.*, depreciation and average interest burden. These latter, conservatively estimated on a 10-year chipper life, amount to $120.00 and $39.60 annually respectively. Deducting these fixed charges from the savings effected in maintenance and power consumption expenses places the net saving per year at $324.30, or $3,243.00 during the 10-year life of the chipper, which represents an annual return on the added investment of 27 per cent.

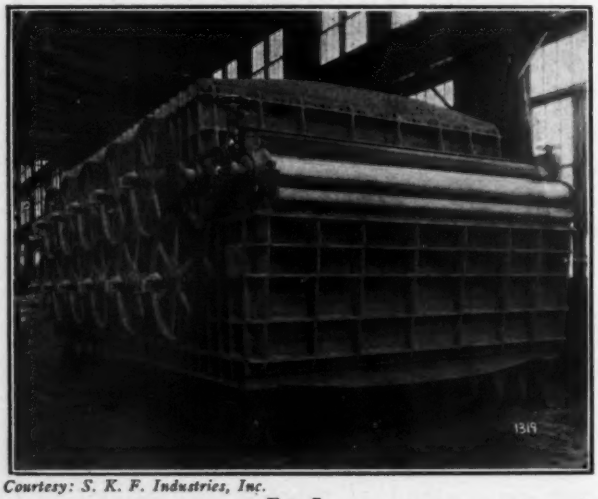
In addition to this estimated monetary saving, there is the 30 to 40 per cent increase in woodroom output, the major part of which is attributable to the anti-friction refinement of the new chipper. Furthermore, the cost of the knives is practically the same as before the increased production, due to the fact that the anti-friction bearings hold the shaft and disc properly aligned, the chipper turning without the vibration which occurs when plain bearings develop wear.

Thus a minor capital investment, represented by the differential in first cost of the chipper with anti-friction bearings, yields a net annual return of 27 per cent., and a 30 to 40 per cent. increase in output is secured at no additional cost. This, to sum up, is the anti-friction bearing dividend on a standard paper making equipment unit developed for rather than by the paper making industry.

### Increased Wire Life Attributable to Anti-Friction Bearings

In the selection of typical examples of anti-friction bearing dividends, interest is very apt to center about the paper machine proper and attention has been focused in this direction by claims advanced by one of the leading anti-friction bearing manufacturers that the equipping of breast rolls with anti-friction bearings increases wire life 30 to 40 per cent. and that similar economies result when the table and wire rolls are so equipped. This is no extravagant claim, furthermore, but very much in line with the experiences at the Fitchburg Paper Company which have been featured in these columns in previous discussions.

Without repeating the somewhat detailed exposition of this



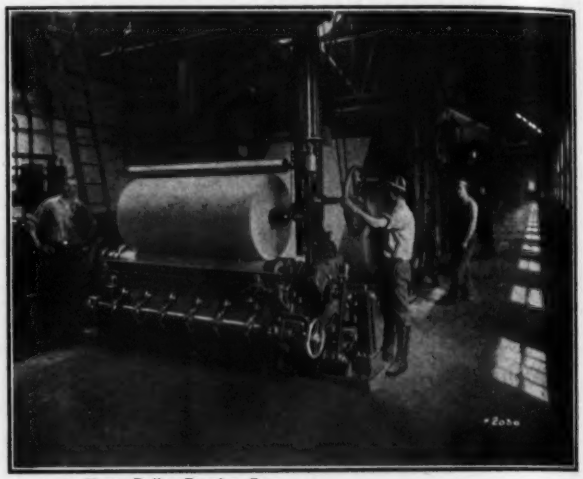
*Courtesy: S. K. F. Industries, Inc.*

FIG. 7

**Minton vacuum drier equipped throughout with anti-friction bearings—11 driers, 134-inch face.**

Fitchburg Paper Company installation already presented, it will be of interest to refer back briefly to specific economies there effected in order to substantiate the 30 to 40 per cent. claim, and particularly so for the reason that the bearing equipment at the Fitchburg plant is of a different type and the product of another manufacturer than the one advancing this particular claim. The machine in question is a 156-inch Fourdrinier fully equipped with anti-friction bearings, carrying in all 344 anti-friction bearings.

The net operating cost of a similar machine equipped with plain bearings totaled to $33,666.63 annually, including items of $1,488.00 for lubrication expenses, $1,198.40 for maintenance, of $9,017.35 for wire replacements and of $21,962.88 for the power consumed annually. The net savings effected in each of these expense factors by virtue of the anti-friction bearing equipment refinement are, 84 per cent. in lubrication costs, 83 per cent. in maintenance, 25 per cent. on the the wires and 25 per cent. in power consumption. In dollars and cents, these savings total



*Courtesy: Hyatt Roller Bearing Co.*

FIG. 8

**Langston slitter and rewinder mounted on anti-friction bearings.**

to $9,978.04 yearly, or to approximately 30 per cent. of the net operating cost of the same machine when equipped with plain bearings.

### Anti-Friction Bearings Applied to Pulp Shredders and Jordans

Still another of the more severe of paper machinery duties which has been successfully met by the installation of anti-friction bearings is that of the pulp shredder used to break up lap pulp as received from wet machines, in order to reduce the time required for proper treatment of the pulp in the beaters. The pulp shredder, often called upon to handle frozen lap pulp, is required to operate with the utmost reliability under unusually exacting conditions, entailing shock load and moisture as well as high speed, yet the refinements of anti-friction bearing equipment quite generally results in effecting substantial economies.

In the case of Jordan engines, a typical example of the economies realized through proper anti-friction bearing equipment was featured in these columns on March 8, 1928, when detailed items were presented covering all operating and carrying expenses entailed in connection with Jordan operation, with both anti-friction and plain bearing equipment, at the Flambeau Paper Company plant. Though it is needless to repeat all the expense items previously published, the sum total of the various savings effected by the anti-friction bearing construction amounts to a matter of $948.58 a year, while the cost of equipping the Jordan with anti-friction bearings entailed a total expense of only $800.00. The annual return on such investment, after deducting all fixed and carrying charges, is one of 95 per cent.

Also, a better finished product is obtained and more stock per unit power input on account of the close limits to which the engine plug can be set and maintained when mounted on anti-friction bearings. In fact, the costly dropping of the plug is to all intents and purposes eliminated with the anti-friction bearing construction.

### Anti-Friction Bearings in Vacuum Dryer Development

In addition to the profitable adoptions of anti-friction bearings to paper machinery requirements, such as presented here and in

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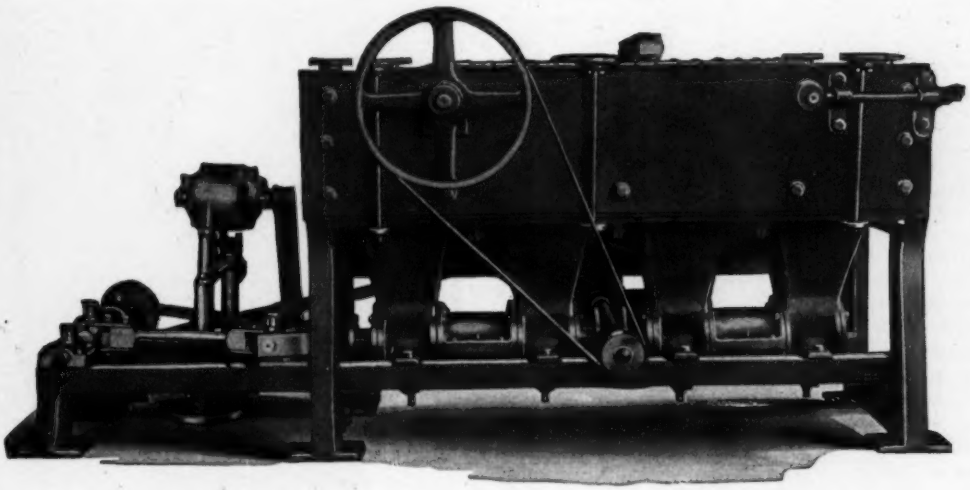

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previous discussions, these friction eliminators have played important rolls in noteworthy paper mill equipment developments, such as the vacuum dryer which has proved such a boon to the paper making industry. To say that modern anti-friction bearings are even one of the devices which made the development of the vacuum dryer possible may sound like an exaggerated statement, but it is very certain that they contributed in no small measure to making the machine the practical unit it has proved to be.

The support of the seal rolls, where the load is particularly severe, reaching as high as 110,000 pounds in some instances, by anti-friction bearings is unquestionably an influencing factor in the successful functioning of the dryer, due to the absence of wear in the bearings. This insures that the rolls will not get out of alignment and break the 28-inch vacuum seal customarily maintained. The bearings supporting the felt, carrying and guide rolls are located inside the machine, furthermore, and are inaccessible when the machine is in operation, making it necessary that the bearings employed require inspection and replacement only at rare intervals.

The adoption of complete anti-friction bearing equipment is directly responsible, naturally, for the remarkably low power consumption entailed in passing the sheets through the dryer and for the high mechanical efficiency of the apparatus. Even including the necessarily appreciable power demand for the pumps required to maintain the 28-inch vacuum, the power consumption of the modern vacuum dryer is less than that consumed by the ordinary dryer section with its fans, while the steam consumption of the vacuum dryer is only about half that of the usual dryer section of the same capacity.

It is difficult, of course, to form any idea of what the anti-friction bearing dividend may be in any such installation. It is certain, however, that the reputed reduction of about $2.00 a ton in the cost of paper made when employing the vacuum dryer would not be realized by a goodly proportion if it were not for the high grade modern anti-friction bearings now available.

### Only Minor Expenditures Entailed

With the exception only of the anti-friction bearing application to vacuum dryers, the examples here presented and in previous discussions on the value of such bearings in pulp and paper mill services have been featured simply to demonstrate possibilities in modernizations of mills and power plants which can almost invariably be consummated with only relatively minor capital expenditures entailed. As in the case of improvement in steam balance in process operations by arresting steam wastes, the betterment of power balance by any substintial reduction of the friction load invariably pays. It typifies a mill and power plant betterment of power balance by any substantial reduction of the more costly capital investment and the progressive mill should take stock of conditions surrounding every plain journal in service, with the view of instigating an unrelenting fight against journal friction wastes. Few more profitable ways of modernizing the plant are to be found.

## Finnish Pulp and Paper Sold Abroad

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 17, 1928.—Finnish manufacturers are receiving numerous inquiries concerning news print for 1929 delivery, according to a report from Consul George L. Tolman, at Helsingfors. Prices remain firm, and this holds true of all classes of paper. Figures released by leading exporters place August shipments of the Finnish Paper Mill Association at 12,003 tons, those of the Kymmene Aktiebolag at 5,885 tons, and of the Finnish Paper Bureau at 4,480 tons, bringing the total for the month up to 22,368 tons.

In chemical wood pulps, manufacturers have already placed about 50 per cent of the 1929 production. Of interest at present is the demand for sulphate pulp, which is more active than for sulphite.

## M. H. Lund Visits Paper Mills

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 17, 1928.—M. H. Lund, recently appointed Commercial Attache to Oslo, has left Washington for a three weeks' trip in this country during which time he will visit paper manufacturers in various parts of the country.

Mr. Lund was in New York yesterday and Monday. During the coming three weeks he will visit the following cities in the order named: Boston, Holyoke, Erie, Middletown, Cincinnati,

M. H. LUND

Hamilton, Dayton, Detroit, Kalamazoo, Chicago, Green Bay, Minneapolis, Wilmington, and Philadelphia.

He will return to New York City on November 21 and will remain there until the 28th at which time he will sail on the President Harding for London. Before going to Oslo Mr. Lund will visit London, Hamburg, Berlin, Copenhagen, Stockholm, and expects to arrive at Oslo on December 28.

## Industrial Changes in Northern New York

ALBANY, N. Y., October 15, 1928.—Clarence C. Smith, secretary of the New York Development Association, delivered an interesting address at Watertown this week in which he traced the change in the industrial situation in Northern New York and outlined what the association is striving to do to promote the industrial life of the North Country.

Ten years ago, he said, pulpwood was relatively close to the mills and it was largely floated to manufacturing centers. Today this system is obsolete, he declared, and the wood is costly to import. This can be corrected, according to Mr. Smith, by the reforestation program now under way and which should be increased. Many people, Mr. Smith said, believed that reforestation is only for the paper mills but this is not true as there are many other large users of wood. With a cheap source of supply wood manufacturing concerns in Northern New York would again thrive and this will be possible in a few years under the reforestation development, he observed.

One of the chief reasons for the change in industrial conditions in Northern New York during the past ten years was declared by Mr. Smith to be the disappearance of relatively cheap water power. Steam electric plants, he said, are giving the North Country keen competition, pointing out that steam plants have been greatly improved, allowing production costs to be reduced more than one-half in the past ten years. One-half of the water in Northern New York is now going to waste, he declared, whereas by a series of reservoirs this waste could be preserved and the water utilized to help reduce steam-electric competition.

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# CONSTRUCTION NEWS

*A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills*

## Construction News

**Dayton, Ohio.**—The Specialty Papers Company, Miami Chapel road and Brockton avenue, has completed plans for a new addition to its plant and will proceed with superstructure at once. It will cost about $42,000, with equipment. General contract has been awarded to Hillsmith & Co., Dayton.

**St. Helens, Ore.**—The Fir-Tex Insulating Board Company, San Francisco, Cal., care of Herbert Fleishhacker, president of the Anglo, London & Paris National Bank, San Francisco, is said to be arranging to break ground at early date for proposed new insulating board mill at St. Helens, where tract of about 150 acres of land recently was acquired. Initial unit will be one-story, 100x1400 feet, and will cost close to $2,000,000, with auxiliary structures and equipment. E. A. Millington is vice-president and general manager.

**Los Angeles, Cal.**—The Buttress Manufacturing Company, 507 Shatto place, manufacturer of wall board products, has plans for a new plant unit at 2201-15 South San Pedro street, to be one-story, 116x165 feet, reported to cost close to $65,000, with equipment. It is purposed to begin work at once. Plans were drawn by the Moran Company, 740 South Broadway, architect, which has secured the general building contract.

**Mobile, Ala.**—The Continental Paper and Bag Corporation 1 Pershing Square, New York, a subsidiary of the International Paper Company, same address, has begun work on its proposed new mill at Mobile, where site recently was selected, to consist of a number of units, with machine shop and auxiliary mechanical structures, reported to cost more than $1,000,000, with machinery. It will have an initial capacity of about 28,000 tons of kraft paper bags per annum. The new unit will be operated in conjunction with kraft paper mill now being constructed by the parent company on neighboring site, scheduled to cost close to $5,000,000, with machinery; it will be a complete self-contained mill unit, and considerable portion of output will be used at the bag mill. The Continental company has machinery installation under way at its new kraft bag mill at Bastrop, La., in course of construction for some months past, and will provide initial machinery for a rating of about 35 tons of finished bags daily. This plan will secure stock from one of the mills of the parent company at this same place.

**Corning, N. Y.**—The Corning Fibre Box Company has closed bids on general construction for its proposed new plant addition, to be one-story, reported to cost about $40,000, with equipment, and will make award at early date. Z. M. Tietzel is company engineer.

**Buckingham, Que.**—The James MacLaren Company, Buckingham, is at the head of a project to construct and operate a hydro-electric power plant and paper and pulp mill in the vicinity of High Falls, about 23 miles from Buckingham, on the Lievre River. It is proposed to build a large storage dam about 20 miles north of High Falls, with a capacity of 25,000,000 cubic feet; the power development will consist of three 30,000 hp. generating units, with provision for a fourth such prime mover at a later date, making a total capacity of 120,000 hp. An extensive transmission system will be constructed. The proposed pulp and paper mill will be controlled by the Maclean company; it will consist of several units, to be devoted primarily to newsprint production, and will secure power supply from the new hydro-electric generating station. The entire project is reported to cost more than $10,000,000; it is understood that plans will be perfected and work started early in coming year.

**West Point, Va.**—The Albemarle-Chesapeake Company, Inc., lately formed by a consolidation of the Albemarle Paper Manufacturing Company, Richmond, Va., and the Chesapeake Corporation, West Point, is said to be making ready for construction of its proposed new paper mill on local site, estimated to cost close to $1,500,000. Initial unit is scheduled to be ready for production early in the coming year. H. W. Ellerson is president.

**Clarksdale, Miss.**—The Clarksdale Chamber of Commerce is said to be in negotiations with a company, name temporarily withheld, which is interested in suitable local site for new mill for the production of pulp products, using cottonseed hulls as source of waste material. Estimated cost of project has not been announced. It is understood that arrangements will be consummated in near future.

**Tuscaloosa, Ala.**—Construction work is ahead of schedule on the new local mill of the Gulf States Paper Corporation, recently formed by officials of the E.Z.Opener Bag Company, Decatur, Ill, and it is expected that operations can start early in January. The company has placed additional orders for full requirements for structural steel and other materials, and has contracted in all for 2500 tons of steel shapes for the structure. The complete project is reported to cost more than $3,000,000, with machinery. Arrangements are being made for the establishment of general offices of the company at Tuscaloosa, and lease has been taken on desirable quarters.

**Richmond, Va.**—The Caukenell Bag Company, recently organized, is making ready for extensive operations at the plant of the Richmond Corrugated Paper Company, Sixth street, which has been secured for initial mill, and will soon start up with a working force or more than 50 persons. Manufacture will be devoted to paper bags and containers of various kinds. Floyd Kent heads the new organization.

**Salem, Ore.**—The Western Paper Converting Company is said to have preliminary plans under advisement for extensions and improvements in mill to double, approximately, the present capacity, reported to cost more than $100,000, with equipment.

**Chicago, Ill.**—The Insu-Lath Company has leased property at 5300 West 65th street, and plans early establishment of new plant for manufacture of special insulating materials, produced in individual sheets, 18x48 in., under a patented process. Factory will total about 17,500 square feet of floor space, and is reported to cost in excess of $35,000. Machinery will be installed at an early date.

**Worcester, Mass.**—The Lincoln Fibre Company, recently organized by Hyman J. Rome, 2 Morningside road, Worcester, and associates, with capital of $25,000, is planning operation of local plant. Mr. Rome will be president and treasurer of new company; Samuel H. Jaffee is interested in the organization.

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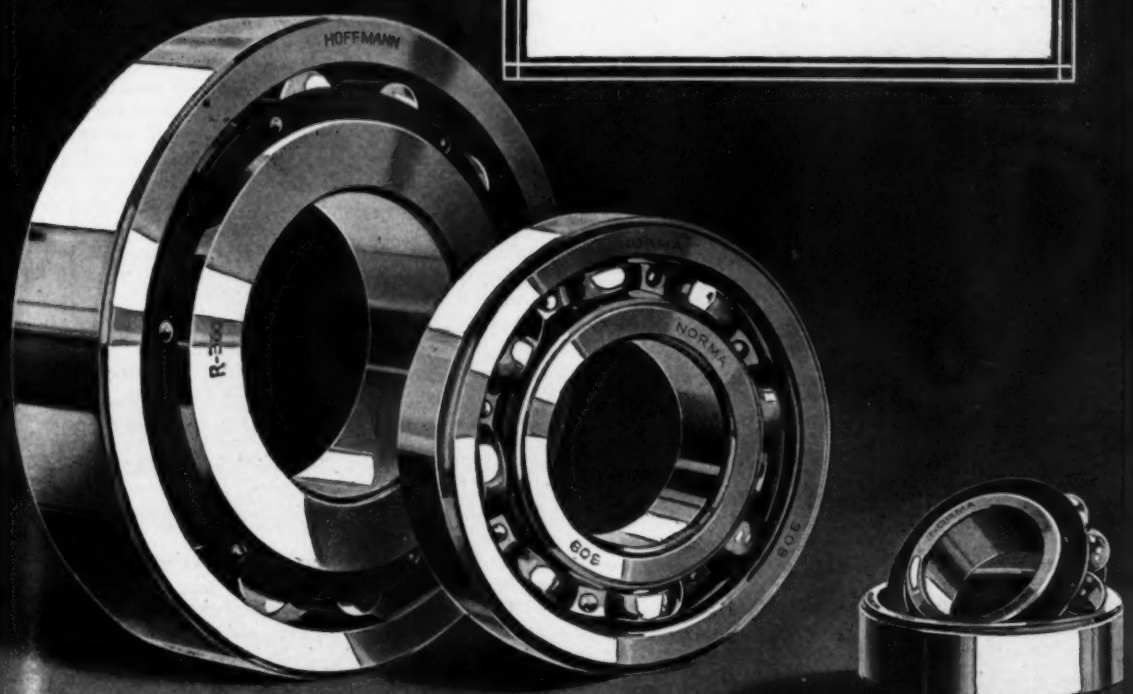



NORMA-HOFFMANN BEARINGS CORPN.-STAMFORD CONN. U.S.A.

N-75

# Western Mills Install New Type Stock Tanks

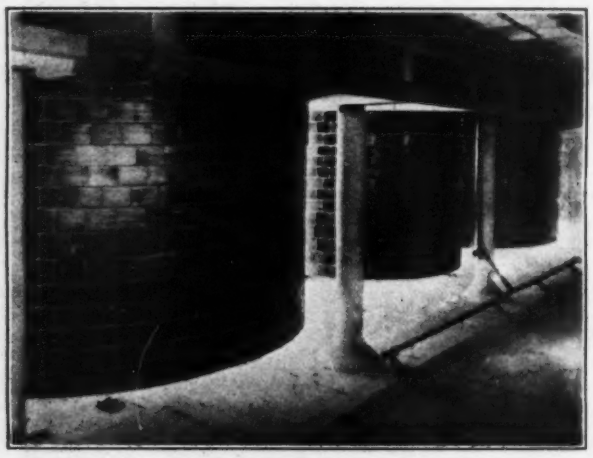
A new type of paper stock tank has recently been developed by one of the wood tank manufacturers who makes a specialty of paper and pulp mill tank requirements.

It is a tank built of highly vitrified glazed fire clay tile. Such a tank gives a smooth glazed surface inside and out, and the advantage in favor of clean stock as well as easily washed surfaces is at once apparent.

While the cost savings are always of interest, the mill man usually finds himself more concerned with what a new piece of equipment will do to help him make better paper. Since clean stock is an urgent necessity in most mills, anything which will contribute to that end is highly desirable.

Construction is a simple masonry job. Any competent mason can build the tanks satisfactorily, although the manufacturer can provide men if required. The tile is in block form, the units being curved to proper circle. Each block is 12 inches long by 10 inches high by 6 inches wide. The weight is but 40 per cent of a monolithic concrete wall of the same thickness. The top of each block is grooved to admit necessary reinforcing rods, number and size of which are determined by the size of the tank. These rods are embedded in the mortar joint, and are completely concealed, thus adding to the appearance of the tank, and doing away with the possibility of rust coming in contact with the stock.

The blocks may be set in either cement or lime mortar, a water-



INSTALLATION AT K. V. P. CO.

proof cement sometimes being used. Only normal care need be taken in setting the blocks in case of stock tanks, as the stock will quickly fill in and close any small crevices. In some instances, joints are pointed with litharge.

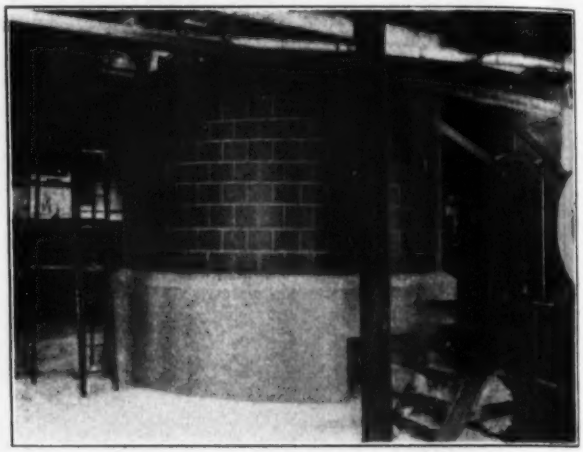
The tanks may be started directly upon existing concrete floors, letting the floor form the bottom of the tank, or raised, as desired. Each block will withstand a load of 2000 pounds to the square inch, and in consequence, agitator equipment may be mounted on the walls of the tank without additional reinforcement.

### Installations at Bryant Paper Co.

One mill, the Bryant Paper Company, of Kalamazoo, Mich., in addition to several stock tanks, is using a tile tank 24 feet in diameter by 20 feet high for the storage of hot water at its conversion plant. This was laid up with waterproof cement mortar, then plastered inside with a ½ inch coat of cement. The tank has been in service over a year and has proven perfectly tight and satisfactory. Tanks of this type are in use elsewhere for cold water storage, requiring no inside plastering.

While round tanks are most commonly used, several mills have erected square and rectangular tanks with this same tile, although usually making use of a block of different size (5 x 8 x 12 or 5 x 4 x 12) for which special corner tile are provided to assure properly broken joints. A number of this type are in use by the Kalamazoo Vegetable Parchment Company, of Kalamazoo, Mich., this mill having over 30 of these tanks storing stock, water, alum (lead lined), bleach liquor and ashes.

R. A. Hayward, general manager of K. V. P., in commenting on



INSTALLATION AT BRYANT PAPER CO.

the installations, says: "We installed them principally because of the fact that there is no dust or dirt that can come from them, and because of the ease and economy of construction. We feel that it makes the best stock tanks for machines that it is possible to build. In every instance we have had very good results from these tanks. We are using them only on stock which has 3 per cent consistency or more, so that we have never had any trouble of leaking from them. The surface of the tile is glazed, so that it is very easy to keep clean, and very quick to wash up. We have recently installed four of these tanks in connection with our new machine."

Until a mortar of satisfactory acid resistance can be found, the tile is not being recommended for acid tanks, although the blocks themselves are not affected by acid.

R. B. Henning, of the Fletcher Paper Company, of Alpena, Mich., writing about the new tanks, remarks: "We have a stock chest and a Fletcher bleacher built of the glazed tile mentioned. The stock chest is 15 feet 1¼ inches diameter and 22 feet high, built on a reinforced concrete base which forms a cone shaped bottom. The tile were set in a 5 per cent lime mortar, the joints pointed with litharge. This tank is used as a dump chest for the Fletcher bleacher, and is agitated by a stream of water playing in the center and by the overflow from the pump supplying stock to the Oliver washer.

"We had considered using air as an agitating medium but found our present method was sufficient.

"This tank leaked at the joints at the start, but the joints filled up with stock after a few days, and we have had no trouble since.

"The Fletcher bleacher is 10 feet diameter and 12 feet 8 inches high, built to the same specifications as the stock chest except that it has a hemispherical bottom."

Other mills which have recently installed these new type glazed tile tanks include the Oxford-Miami Paper Company, of West Carrollton, Ohio; the Port Huron Sulphite and Paper Company, of Port Huron, Mich.; the Simplex Paper Company, of Palmyra, Mich., and the Western Board and Paper Company, Kalamazoo, Mich.

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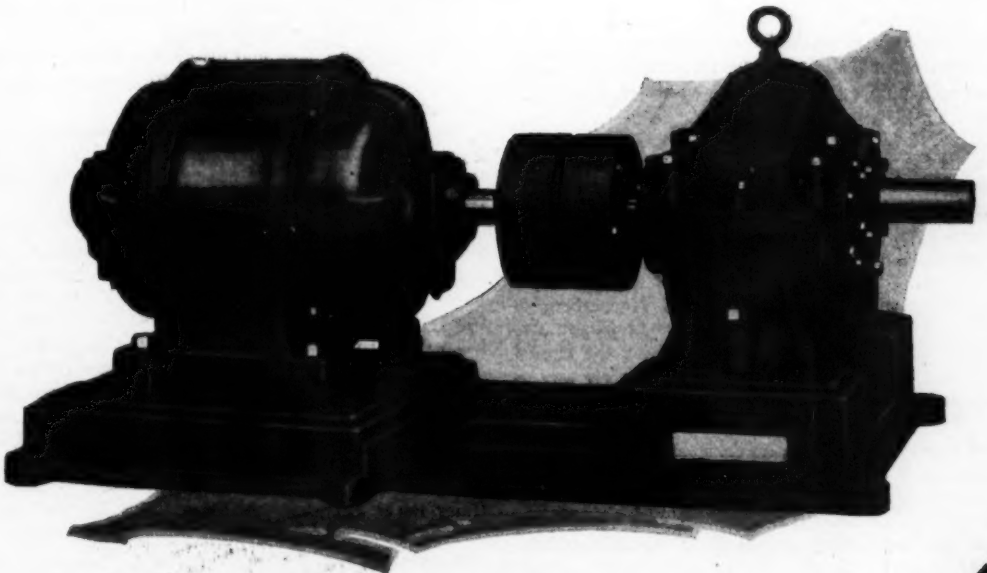

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# New York Trade Jottings

Arthur Baker, managing director of Bowaters, Ltd., Gravesend, Kent, England, was a visitor at the TAPPI office last week.

* * *

Vincent Jones, of the Anglo-Newfoundland Development Company, Grand Falls, Newfoundland, is a New York visitor this week.

* * *

The Sales Department of the Ticonderoga Pulp and Paper Company has been removed to 100 East 42nd street, New York. Telephones Caledonia 0960-0961.

* * *

Anders Hellstrom, managing director of Papyrus Paper Mills, Ltd., of Molendal, Sweden, arrived in New York recently and is studying the paper industry in the United States.

* * *

The News Print Service Bureau is sending a detailed statistical statement of the news print situation to its members instead of holding a meeting which it generally does at this time of the year.

* * *

Net profit of Johns-Manville Corporation and subsidiaries for quarter ended September 30, 1928, was $1,722,451 after expenses, federal taxes, etc., comparing with $1,600,438 in preceding quarter. Net profit for first nine months of 1928 totaled $4,095,595.

* * *

Theodor August Overwien, a chemical engineer from Oslo, Norway, was a visitor at the Technical Association offices last week. Mr. Overwien possesses a scholarship which will enable him to study sulphate pulp manufacture for six months in the United States.

* * *

Howard H. Harrison, of the Crystal Tissue Company, Middletown, Ohio, has been accepted by the Joint Committee on Approved Pulp Testing Chemists for the Paper Industry of the United States as an approved mill pulp testing chemist and is listed as such, effective October 15, 1928.

* * *

The Prat-Daniel Corporation are now in their new home at 183 Madison avenue, New York. This speaks well for business conditions, or probably more likely for Thermix stacks and air heaters, as the space mentioned is several times that previously occupied for offices by these manufacturers.

* * *

Holger A. E. Nilsson, managing director of Kopparberg & Holfors Sagverks, A/B Okelbo, Sweden, and Gunnar Magnusson, of Skonvik A/B, Skonvik, Sweden, who are visiting the United States, were in New York recently and are now on their way to the Pacific Coast with Gustav Aslund of the Swedish Consulate.

* * *

The Freeport-Texas Company reports for quarter ended August 31, 1928, net income of $680,962 after expenses and reserves for depreciation and taxes, equivalent to 93 cents a share earned on 729,844 shares of no-par stock. This compares with $866,271, or $1.19 a share, in preceding quarter and $1,102,726, or $1.51 a share in third quarter of 1927. Net income for nine months ended August 31, 1928, totaled $1,952,393 after above charges, equal to $2.67 a share against $2,702,315, or $3.70 a share, in same period of preceding year.

* * *

Professor R. F. Reed, of the Department of Lithographic Research (Lithographic Technical Foundation) of the University of Cincinnati, will be the speaker at the October 29 luncheon of the New York Division of the Salesmen's Association of the Paper Industry. The research work Professor Reed is doing for the Lithographic Technical Foundation is of the greatest importance to paper manufacturers, because of the present day lack of exact knowledge on the part of both the lithographic and paper industries, as to the properties necessary for good paper for lithography. Also to work Professor Reed is doing will lead to improvement in the technique of the lithographic industry with consequently better results in the finished work. It is expected that there will be an unusually large attendance at this luncheon meeting.

* * *

The Texas-Gulf Sulphur Company, Inc., reports for quarter ended September 30, 1928, net income of $3,680,723 after depreciation and federal taxes, but before depletion, equivalent to $1.44 a share earned on 2,540,000 shares of no-par stock. This compares with $3,586,819 or $1.41 a share in preceding quarter, and $2,936,189 or $1.15 a share in third quarter of 1927. Net income for nine months ended September 30 totaled $10,355,381 after above charges, equal to $4.07 a share comparing with $9,053,097 or $3.56 a share in first nine months of previous year. During third quarter company increased its reserves for depreciation and accrued federal taxes by $328,235, making total of these reserves $11,453,665 on September 30, 1928. All assets subject to depreciation in connection with operations at Gulf, Texas, are now entirely offset in these reserve accounts.

## Union to Defend Watermark Suit

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., October 22, 1928.—Attorney Michael J. Reilly, of this city, has been engaged by the International Brotherhood of Papermakers to represent that organization in the action brought by the government charging a monopoly in restraint of trade under the Sherman anti-trust law in connection with the manufacture and distribution of union watermarked paper. Announcement to this effect was made here this week. The Brotherhood claims that the loss of this action will endanger the existence of every union label and that the outcome will be of importance to every union in the country.

The United States Marshall's office had representatives in this city this week and served a subpoena on Matthew J. Burns, former secretary of the union, and also left a subpoena at the home of William R. Smith, president of the Brotherhood, who is in Canada in connection with a strike.

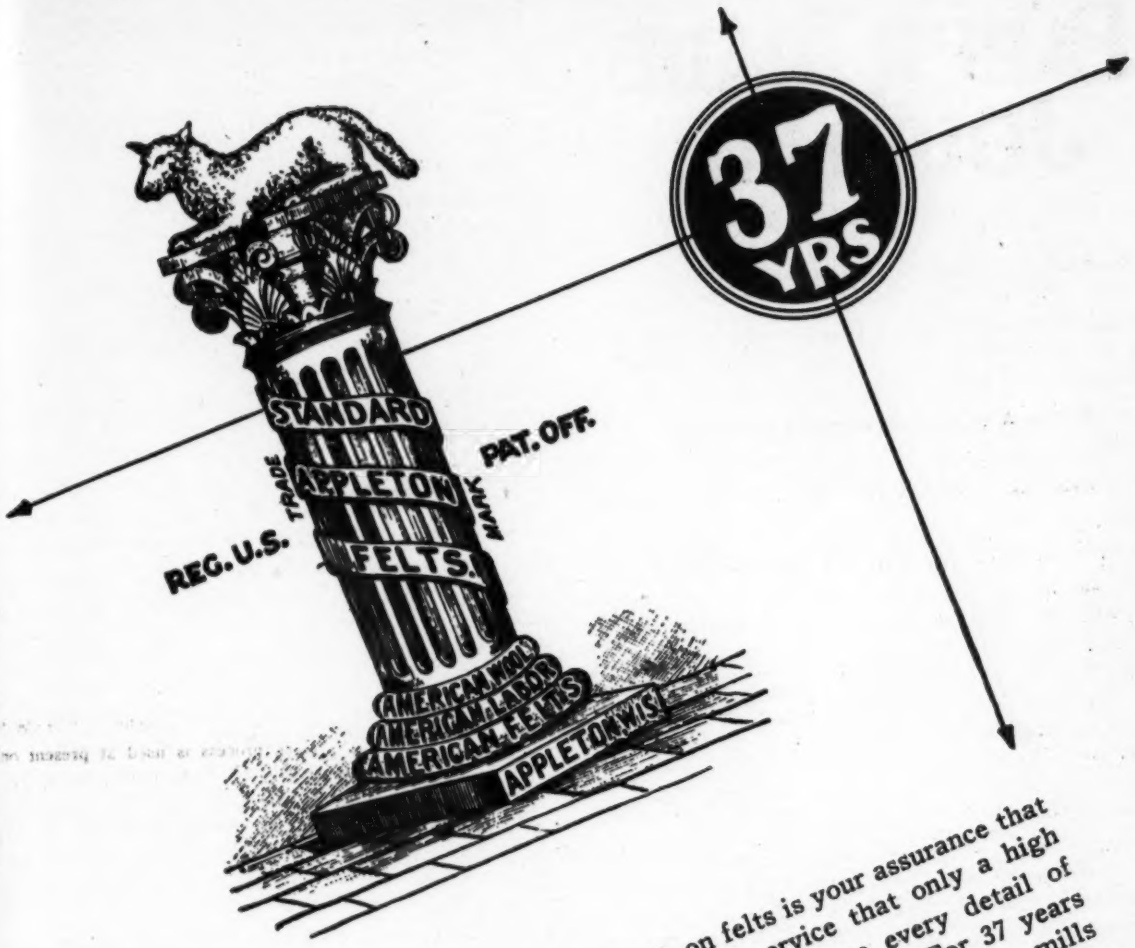
The subpoenas as served give the International Brotherhood of Papermakers 20 days in which to make answer to the charges. The law holds that individuals are responsible in connection with an unincorporated association such as the Brotherhood.

A subpoena will accordingly be served on Frank P. Barry, first vice president, as soon as he returns from Canada. Others subpoenaed in the action are Edward Alden, of Holyoke, Mass., Unity Paper Company, of Potsdam, N. Y., Hopper Paper Company, of Taylorville, Ill., and the American Writing Paper Company, of Holyoke.

The International Brotherhood of Papermakers has been turning out the union watermarked paper for 25 years, according to Secretary Arthur Huggins, but made no effort to push its sale until about fifteen years ago. At the present time about 600 tons of the union watermarked paper in the finer grades is being manufactured yearly, the bulk of this coming from the Potsdam mill of the Unity Paper Company. Attorney Reilly is now engaged in preparing the union's answer which will be filed probably during the next week.

## Heat Transfer and Crystallization

The Whiting Corporation, of Harvey, Ill., has just published Article No. 111 of its series of articles on Heat Transfer and Crystallization, by Professor W. L. Badger, of the Department of Chemical Engineering, University of Michigan, Ann Arbor, and Director of Research for the Swenson Evaporator Company, subsidiary of the Whiting Corporation. The booklet describes and illustrates the various types of evaporator equipment in a comprehensive manner and should prove of great interest to paper mill engineers.

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Vol. LXXXVII New York, Oct. 25, 1928 No. 17

## NEW CONSTRUCTION IN THE INDUSTRY

This Mill Number of the PAPER TRADE JOURNAL visualizes impressively the remarkable expansion that has been taking place in the pulp and paper industry of the United States and Canada during the past year. It presents stories and many interesting pictures of the outstanding new mills and the important improvements to going mills that have been recently made. This number, it is believed, presents most convincing proof of the sound basis conditions of the industry and of enterprise that will be difficult to match in any other field.

During the year most interest in the way of expansion has again centered in the region of the Pacific Northwest. Considerable ferment, as was to be expected, still attaches to the operations in that section, but there is ample evidence that this is subsiding and that a large proportion of the ventures that are reported are backed by adequate capital and have behind them other resources that are necessary for ultimate success.

Perhaps the most interesting feature of the year in the development of the industry on the Pacific Coast is the consummation of plans by representative Eastern paper manufacturers to locate plants in that territory. The Hammermill Paper Company, known widely for the excellence of its product and the thoroughly up to date methods of paper making practiced at its plant at Erie, Pa., is building a sulphite paper mill at Hoquiam, Wash., and will utilize sulphite pulp from the plant of the Grays Harbor Pulp Company, just placed in operation in the same town. The Union Bag and Paper Corporation, another representative Eastern concern, is building and will place in operation shortly, a sulphite pulp mill at Tacoma, Wash. This in itself is impressive evidence that the pulp and paper industry is substantially established on the coast and that it is likely to prosper and show continuous growth as time goes along.

The uniform excellence of mill structures and the fine equipment installed in the mills of the Pacific Northwest are impressive factors about the development in this section. Judging from the reports, the mills in almost every case represent just about the last word in paper mill construction and contain the most approved and up to date pulp and paper making machinery regardless of cost.

As regards sulphate pulp especially, Mr. W. G. MacNaughton, engineer of the News Print Service Bureau, who has just returned from a long trip through the Pacific Northwest, is responsible for the statement that in the new sulphate pulp mills of this section is to be seen the most advanced equipment and practice of the North American continent, if not in the world.

The South has decidedly increased its position as a pulp and paper manufacturing center during the year. Among the representative mills which have just been started or are just about to go into operation are the International Paper Company, Southern Division, at Camden, Ark., making 300,000 pounds per 24 hours of kraft, wrapping and bag and 350,000 pounds per 24 hours of sulphate pulp; Gulf States Paper Corporation, Tuscaloosa, Ala., making 200,000 pounds per 24 hours of kraft, wrapping and bag and 300,000 pounds of sulphate pulp, and the Southern Advance Bag and Paper Company at Hodge, La., making 150,000 pounds per 24 hours of kraft and bag and 200,000 pounds per 24 hours of sulphate pulp. This latter mill contains a 242-inch Fourdrinier, which, it is believed, is the largest kraft paper machine at present in operation.

In the South, among the new mills which is outstanding, not because of its size, but because of several unique features, is that of the Sylva Paper Board Company at Sylva, N. C. a subsidiary of the Mead Paperboard Corporation. This mill utilizes chestnut chips from which the tannin has been extracted. This waste was formerly burned as fuel. The chips are reduced to pulp by the semi-chemical process, which process is used at present only by one or two other mills in the country. It is attracting considerable attention, however, and will undoubtedly be more widely utilized by the mills soon. The pulp is refined by four rod mills. The Mead Paperboard Corporation has another subsidiary, the Southern Extract Company at Knoxville, Tenn., which utilizes this same process.

Canada has kept up a rapid pace of expansion of her pulp and paper industry throughout the year. The largest and perhaps most interesting addition to her new mills, has been the new plant of the Spruce Falls Power and Paper Company, Ltd., at Kapuskasing, Ont., a subsidiary of the Kimberly-Clark Corporation. This mill, which has just gone into operation, has been built in connection with the *New York Times*. It contains four 234-inch Fourdriniers and produces news print at the rate of 1,000,000 pounds per 24 hours. The company also has a sulphite pulp mill, in connection with the plant, which, however, was started some time ago. Other mills that have just been placed in operation in the Dominion include the plant of Dominion Boxboards, Ltd., at Toronto, Ont., and the Canadian Paperboard Company, also at Toronto. These mills are especially interesting because they will furnish a considerable addition to the tonnage of paper board, which is a variety of paper product which Canada has not produced very largely as yet.

In addition to the numerous new mills, the year has witnessed unusual activity in the way of mill additions and mill improvements. Northern New York has been especially prominent in this respect, with the International Paper Company, the St. Regis Paper Company, the West Virginia Pulp and Paper Company, and the A. P. W. Paper Company, taking a leading part. Practically every paper mill center, however, witnessed, more or less, improvements to its pulp and paper plants in the way of additions, installations of new machinery and the building of new power

houses or revamping of old ones. In general, in fact, the opinion may be safely ventured that the year as regards new constructions and mill improvements has been one of the most decidedly active in the history of the industry. This obviously indicates a sound condition of affairs financially and the utmost confidence on the part of representative manufacturers in the immediate future of the pulp and paper industry.

## Soviet Union Buys Fourdrinier

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., October 22, 1928.—The United States of Soviet Russia early this week closed a contract with one of the large Northern New York manufacturers of paper mill machinery for a 234 inch news print paper-making machine which will be the first American paper machine sent to Russia. The contract calls for the shipment of the machine by June 1, 1929. It will be installed in a government owned mill at Moscow.

The contract for the new machine followed a recent trip through Northern New York of representatives of the Soviet government who investigated and saw in action machines made by various concerns. The delegation of officials was not empowered to place a contract but the papers were later signed in New York City after several conferences between the American financial representatives of the Soviet and officials of the machinery manufacturing company.

It is understood that this machine is likely to be the first of many to be purchased in this country as the Soviet government is beginning development of the Russian paper industry which is said to be in its infancy in that country.

The new machine will be capable of producing 1,200 feet of paper a minute. It will be installed in a new mill which will be entirely equipped with American made machinery. It will be entirely driven by electricity and complete and modern in every respect. While the machine is considered large for a news print machine there are larger machines in operation in American and Canadian mills.

## To Head Paper and Twine Division

S. T. Baron and Murray Schlosser have been selected to lead the Paper and Twine division of the Business Men's Council of the Federation for the Support of Jewish Philanthropic Societies of New York City which on Sunday, October 21, will launch its 1928 campaign for $5,300,000 to meet the budgetary requirements of its ninety-one constituent institutions. The quota for this division has been set at $30,000.

Under the direction of these men, workers of the Paper and Twine division who have pledged their support to the federation's money-raising efforts in behalf of its affiliated societies will meet their fellow-workers of the 142 industrial and professional divisions constituting the Business Men's Council at a meeting to launch the campaign at the Hotel Commodore on October 21.

Dudley D. Sicher, Chairman of the Business Men's Council, the organization responsible for the money-raising activities of the Federation, has issued an appeal to the workers of the various industries and professions urging their unstinted cooperation in the coming campaign.

## Form New German Cartel

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 10, 1928.—Leading German manufacturers of highly glazed wrapping papers have combined into an association to be known as the Vereinigte Packseiden Gasellschaft mit beschraekter Haftung with headquarters in Berlin, where is located the Central Committee of German paper and pulp interests. The new cartel calculates to fix prices and control conditions of sale for the domestic market, while selling direct for export, according to a report received by the Department of Commerce.

## Sue To Determine Water Power Rights

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., October 23, 1928.—The Holyoke Water Power Company has filed a suit in equity with the Supreme Judicial Court at Springfield against the Whiting Paper Company and Whiting & Co., Inc., in relation to the use of the water rights obtained by the defendants with the purchase of the Lyman mills plant some months ago. It is the first suit ever filed in effect to request the Courts of the state to construe and interpret the proposals and indentures of the Holyoke Water Power Company. Inasmuch as this is the case, and inasmuch as many other similar indentures have been granted to other paper mill owners and other corporations, the result of the suit is being looked forward to with much interest by power users here.

One of the principal matters at issue is whether the new owners of the Lyman Mills mill power rights, which are 16 hour rights, can use these rights in any 16 hours of the 24 that they desire. By common usage the use of 16 hour mill power rights has been from 6 a. m. to 10 p. m. The Whiting concern however maintains that there is nothing in the indentures that legally requires the use of water power in any set period of the 24 hours; and as it desires to use part at least of the water rights for operating its paper machines, asserts its right to use them nights if it so elects. This question has never been brought up by other lessees; and as the Holyoke Water Power Company objected to this, an appeal to the courts was made.

Another point at dispute is whether the use of the mill power rights can be transferred from one plant or parcel of property to another. In other words if the Whiting concern by purchase of the Lyman Mills obtains certain mill power rights can it use the same in its No. 2 mill adjacent to the Lyman Mills? The original mill power rights granted to the Lyman Mills were indentured water rights; that is, they were sold with the mill land; and the vital question is whether these mill powers bought of the Lyman Mills must be used on the Lyman Mills property as originally sold. The controversy is highly technical; and it is expected after a preliminary hearing the court will appoint a master to hear the parties at interest and to report back to the court.

The Whiting Paper Company owns two paper mills, No. 1 and No. 2, the No. 2 mill being on the second level adjacent to the former Lyman Mills which is owned and controlled by Whiting & Co., Inc., a holding concern for the recent purchase. The defendants are requested to make return within 20 days and the bill is returnable the first Monday in November. Hon. William F. Whiting, secretary of commerce, is principal owner of the property although the official and executive work is being carried on by his sons, Edward C., William and Fairfield Whiting.

Part of the mill power rights now to be brought into court date back to 1854 when the Hadley Falls Company, forerunner of the Holyoke Water Power Company, granted water rights to the Lyman Mills. Another part was obtained in 1872 from the late Congressman William Whiting, Levi L. Brown and Stephen Holman.

The granting of mill power rights was copied from the procedure of the Locks & Canals Company of Lowell and the Essex Company of Lawrence, two large water power developments that preceded the Holyoke Water Power Company and its predecessors. Recently City Solicitor Jacob Ogan ruled on a somewhat similar case that the Holyoke Municipal Gas and Electric Company could transfer power from one parcel of land to another.

## Paper Board Hearing, Chicago Nov. 3

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 24, 1928.—Announcement has been made by the Federal Trade Commission that Saturday, November 3, has been set as the date for a previously announced trade practice conference of the paper board industry to be held in Chicago, at the Sherman Hotel. Commissioner Abram F. Myers will preside.

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Edited by
RONALD G. MACDONALD, Secretary

# The Semi-Sulphite Process

## 1.—Preliminary Studies

By C. C. Heritage,[1] C. E. Curran,[2] W. H. Monsson,[3] and G. H. Chidester[4]

During the past five years, the Forest Products Laboratory has conducted investigations on the modification of existing standard pulping processes in order to secure increased yields of pulp without material sacrifice of pulp quality. As a premise from which to reason, it seems a somewhat questionable practice that considerable care should be taken to produce pulps of high cellulose content when for the larger-tonnage lower-grade uses they are immediately mixed with large quantities of the original wood substance, namely, ground-wood pulp. Likewise, it seems quite possible to make, by proper fiber-processing methods, high-yield chemical pulps that are fully equal or are even superior to high-cellulose pulps in the physical properties necessary, from the standpoint of use requirements, in certain grades of finished paper.

Although the principal objective of these investigations, as far as the Laboratory is concerned, has been improved utilization of the pulp wood at the mill and hence increased timber reserves, secondary objectives have been the lowering of manufacturing costs and the improvement of stream conditions by decreasing the waste liquor to be disposed of.

These investigations resulted first in the development of the semi-kraft[5] and later the semi-chemical process.[6] More recently a series of exploratory digestions, based upon modifications of the commercial "quick-cook" sulphite process, have been made. The purpose of this paper is to report upon this exploratory work. In accordance with nomenclature previously chosen, this mild sulphite pulping process is referred to herein as the semi-sulphite process.

### Semi-Sulphite Process

The semi-sulphite process as developed at the Forest Products Laboratory consists of a mild pulping action employing the usual constituents of sulphite cooking liquor but so regulating the conditions of temperature, time, concentration, and ratio of acid to chips that the chips, although thoroughly impregnated, are only softened and thus retain their original form, at the end of the reaction, to a large extent. The softened chips are "blown" from the digester in the customary way, are thoroughly washed, preferably with warm water, and are then mechanically disintegrated to a true pulp by suitable equipment. For this purpose, the rod mill has been found satisfactory, although other types of refining equipment can possibly be used as well.

Results obtained with the refined pulp indicate that it can be substituted, pound for pound, for the sulphite pulp now being used in news print and wrapper manufacture, without affecting the quality of the final product.

In the preliminary study recently concluded, satisfactory pulp was obtained from white spruce, with yields of softened chips varying from 63 to 75 per cent by weight on an oven-dry basis; the amount of yield depended on the severity of the softening conditions employed. Exploratory digestions were made employing eastern hemlock, jack pine, and loblolly pine with resultant yields varying from 56 to 73 per cent; the yields likewise depended on the conditions employed.

#### Cooking Acid and Cooking Schedules

The cooking liquor was prepared in the usual manner, described in previous sulphite publications of the Laboratory,[7] using liquid sulphur dioxide and hydrated lime.

Acid concentrations varying from 3.55 per cent to 5.5 per cent total sulphur dioxide content, of which 0.85 per cent to 1.2 per cent was in the form of combined sulphur dioxide, were used. The semi-commercial sulphite digester that has been described previously[8] was employed.

The temperature schedules followed were practically identical in type throughout the study. One and one-half to two hours were employed as the impregnation period in bringing the temperature of the digester to 110° C. At this point a different but still uniform rate of temperature rise was begun; it was selected to give a maximum temperature. The relief was so regulated during the process as to maintain a pressure of 75 pounds per square inch, with a uniform relief period at the end of the digestion.

#### Yield Determination

The yield of softened chips was determined by pressing out the excess wash water, using a hydraulic press, and then weighing the pressed chips and sampling them for moisture.

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[2] Assistant in Charge, Section of Pulp and Paper, U. S. Forest Products Laboratory, Madison, Wis.
[3] Associate Chemist in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.
[4] Assistant Engineer in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.
[5] Paper Trade J. 80, No. 11, 55-57 (1925).
[6] Paper Trade J. 83, No. 13, 50-53 (1926).
[7] Paper Trade J. 86, No. 12, 59-62 (1928).
[8] Paper Trade J. 74, No. 15, 295-305 (1923).

### Characteristics of the Development of Strength

Fiber strength was developed in the softened chips by the standard Laboratory ball-milling method. Hand sheets were prepared from pulps treated for various lengths of time, such as 20, 40, 80, 120 and 160 minutes, and were tested. The pulps reached their maximum bursting strength of 1.0 to 1.2 points per pound per ream in 60 to 120 minutes. Maximum folding strengths for the spruce and hemlock pulps were approximately 400 double folds. Maximum tearing strength developed prior to 40 minutes milling, reaching values of 1.5 to 2.2 grams per pound per ream.

The strength characteristics of semi-sulphite pulp compare favorably with commercial grades of news sulphite pulps that have been evaluated at the Laboratory during the past years.

### Rod-milling Treatment of Softened Chips

As mentioned previously, the disintegration of the softened chips was carried out in a semi-commercial rod mill.[9] Earlier experiments using the rod mill as a disintegrator had shown that excellent results can be obtained on semi-chemical chips at a consistence of 8 per cent. Accordingly, the preliminary milling studies reported here were made, operating batchwise, at 8 per cent consistence. The batchwise method of reducing the chips to pulp was used in preference to the continuous so that milling conditions could be regulated more closely.

The time of milling was varied from 15 to 45 minutes. From the results obtained the optimum milling time appears to be from 30 to 45 minutes. The milled pulp was brushed lightly in the water in admixture with ground-wood, and the resulting stuff was refined in the Jordan.

#### Experiments In Paper Making

Since the product of largest tonnage in which semi-sulphite pulp may find use in newsprint, practically all paper-making experiments were confined to duplicating commercial news print quality.

Runs on the paper machine were made, using various proportons of rod-milled stock and of commercial spruce ground-wood. Satisfactory sheets of news print were made on the Fourdrinier machine, using a furnish of 25 per cent spruce semi-sulphite pulp and 75 per cent spruce ground-wood pulp. The sheets were judged on the basis of bursting, folding, tearing, and tensile strengths, and color. Hemlock gave results equally good, and even jack pine appeared promising. The tearing strength was the only physical property measured that was not fully equal to average commercial print. Further studies of fiber processing may show the way to improve this property.

#### Power Consumption for Milling

The power consumed in producing semi-sulphite pulp will vary with the mildness of the cooking and the type of pulp desired. In comparing the power consumption of the experimental rod mill, running batchwise, with that of a commercial mill (6 feet in diameter by 12 feet long) running continuously, it has been found that continuous operation requires roughly about twice the milling time of batchwise, and the large mill requires about one-third the energy consumption per ton of the experimental one. As an example of the power consumed for disintegration of the softened chips in the experimental rod mill, 12.1 horsepower-days were required for milling 0.6 ton of spruce chips, which is 20.2 horsepower-days per ton. On a commercial scale it is estimated that a power consumption of $\frac{20.2 \times 2}{3}$, or 13.5 horsepower-days per ton, would be required.

[9] Paper Trade J. 83, No. 12, 53-54 (1926); 83, No. 24, 43-44 (1926).

TABLE 1
COOKING CONDITIONS AND YIELD DATA OF A TYPICAL COOK

| Species of wood | Acid Composition: Total $SO_2$, per cent | Acid Composition: Free $SO_2$, per cent | Acid Composition: Combined $SO_2$, per cent | Oven-dry weight of chips, pounds | Volume of cooking acid added, gallons | Duration of cook, hours | Time to 110° C., hours | Maximum temperature,[1] deg. C. | Yield of softened chips—basis oven-dry wt. of wood, per cent |
|---|---|---|---|---|---|---|---|---|---|
| White spruce | 3.55 | 2.70 | 0.85 | 75.2 | 47 | 6 | 2 | 132 | 75.5 |

[1] A uniform rate of temperature increase was used from 110 degrees C. to the maximum value, and a maximum pressure of 75 pounds gauge was employed.

TABLE 2
ENERGY CONSUMED IN REFINING SEMI-SULPHITE PULP, BEATER FURNISH, AND PHYSICAL PROPERTIES OF MACHINE-MADE PAPER (NEWS PRINT)

| Milling time, minutes | Unit energy consumption: 3'x5' mill batchwise, H.P. days | Unit energy consumption: 6'x12' mill continuous H.P. days | Rate of milling per 24 hours based on a commercial 6'x12' mill, tons | Beater furnish[1]: Semi-sulphite pulp, per cent | Beater furnish[1]: Spruce groundwood pulp, per cent | Time of pulp in beater[2] | Physical properties of finished paper: Weight per ream of 24x36x500, pounds | Physical properties of finished paper: Thickness, inches | Physical properties of finished paper: Bursting strength factor, pts./lb./ream | Physical properties of finished paper: Tearing strength factor, gr./lb./ream |
|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 23.6 | 15.7 | 6.4 | 25 | 75 | 35 | 32.8<br>32.0 | 0.0032<br>0.0036 | 0.39<br>0.28 | 0.72<br>0.74[3] |

[1] Size, alum, clay, and dye-stuff added.
[2] For mixing only.
[3] Average values for 18 samples of North American commercial news print.

### Conclusions

From the results of this exploratory work, the following conclusions may be drawn: (1) The semi-sulphite process appears to offer a means by which a high yield of pulp suitable for news print and other grades of coarse paper can certainly be obtained from spruce and hemlock, possibly from hardwoods and mixtures, and perhaps from some of the more resinous species such as jack pine. (2) The yields obtained can be varied at will from 25 to 50 per cent in excess of present mill practice. (3) A considerable saving can be effected in the time required for cooking. (4) A maximum bursting strength of a point per pound per ream or more can be obtained for the pulp. (5) Screenings can be eliminated, since the total digester charge is utilized. (6) Approximate cost estimates indicate an ample margin of saving over the additional power and fixed charges incurred by rod milling. (7) Difficulty in discharging the digester by its own internal pressure would probably develop at yields above 60 to 65 per cent. The recent trend in mill construction toward the employment of gravity discharge after complete release of pressure appears to meet such a difficulty. (8) The field of semi-sulphite pulping presents an exceptional opportunity to accomplish a number of desirable ends by one means; hence it will continue under active investigation at this Laboratory.

## To Build Paper Bag Plant at Mobile

The International Paper Company has begun construction of a paper bag plant at Mobile, Ala., which will have an annual capacity of about twenty-eight thousand tons of grocery bags and printed specialties. The plant is being built by the Continental Paper and Bag Corporation, a subsidiary of the International Paper Company, in conjunction with the kraft paper mill which the International is erecting at Mobile, and will use a portion of the product of that mill in the manufacture of paper bags.

The Mobile plant is the eighth paper bag plant of the company, the others being at Rumford Falls, Me.; Brooklyn, N. Y.; Wellsburg, W. Va.; Camden, Ark.; Bastrop, La.; Marinette, Wis., and Ottawa, Ont. The Camden plant—now nearing completion—and the Wellsburg plant are owned by the George & Sherrard Paper Company—another subsidiary of the International Paper—and the other plants are owned and operated by Continental Paper and Bag Corporation.

# The Microstructure of a Wood Pulp Fiber*

By George J. Ritter[1] and G. H. Chidester[1]

The results presented in this paper were obtained in fundamental study that the Forest Products Laboratory is making in its investigation of the behavior of wood, largely for the purpose of bettering the utilization of wood. These results will here be considered in connection with the problems that confront the pulp and paper manufacturer.

## I.—Constituents of Wood

### Constituents Commonly Wasted

The manufacturer of pulp and paper naturally is interested in the nature and the location of the constituents of wood that are removed during the preparation of wood pulp.

Lignin is the major component (28.0 per cent) of the part of the wood that is removed during the manufacture of sulphite pulp. (Fig. 1). It exists in two forms,[2] which differ somewhat in chemical composition.

One form is the binding material (middle-lamella lignin) between the wood fibers; the other is a finely divided amorphous material (cell-wall lignin) in the cell wall. Whether the cell-wall form is chemically combined with the cellulose in the wall or is physically distributed throughout is not known definitely. If all the constituents except lignin are removed from a transverse section of wood, the two forms may be seen with the aid of a microscope. One form, the middle lamella, is revealed as a net-work; the other, the cell-wall form, appears as a finely divided agglomerated residue in the space formerly occupied by the lignified cellulose in the cell wall. (Plates 1 and 2.)

Further, if all the constituents except lignin are removed from transverse sections, which have been cut thicker than those were used in Plates 1 and 2 so that the net-work might remain intact during washing, the two forms of lignin may be separated. By impregnating the net-work residue with paraffin, thin sections of the middle-lamella lignin may be cut and photographed. (Plates 3 and 4.)

In addition, two other groups of components, the pentosans not in cellulose and the extractives, approximately 6 per cent each, are a total loss to the manufacturer of chemical pulp and paper (Fig. 1) and, still, further, the difference between commercially bleached sulfite cellulose and chlorinated cellulose (20 per cent of the wood) is another loss of lignin-free material that in all probability is an excellent paper-making material. From work done in the Pulp and Paper Section of the Forest Products Laboratory, it is known that the unbleached sulphite pulp yields can be increased from the usual 40 per cent to approximately 50 per cent with simultaneous improvement of the quality of the pulp.

Lastly, the viscose manufacturer in using the sulphite cellulose wastes another 7 per cent of the spruce wood, leaving but 34 per cent to be utilized.

In Fig. 1 the unshaded portions to the right of the shaded ones representing the three kinds of cellulose offer promising fields for research that may some day produce valuable by-products to the pulp and paper industry.

### Constituents Commonly Utilized

Cellulose, which is practically the sole constituent of chemical wood pulp, consists of various carbohydrates when it is prepared from wood. When isolated by chlorination it constitutes approximately 60 per cent of the total wood (Fig. 1), forming the major portion of the cell wall. In general, it consists of pointed capsular fibers. A knowledge of the minute structure and the properties of these fibers is of importance to the paper maker, to enable him to best adapt his processes to work in harmony with them rather than against them.

## II.—Microstructure of the Wood Fiber

### Separation of Layers in the Cell Wall

The cellulosic material used in examining the microstructure of the wood fiber was prepared from thin longitudinal wood shavings. These shavings were delignified by the Cross and Bevan method, were dehydrated with alcohol for several days, and were kept in alcohol until required for use.

Examination of delignified fibers after they had received alternate swelling and shrinking treatments[3] with alkali and with acids indicated that the cell wall is in a manner similar to that of the cell-wall layers of cotton[4] composed of several layers packed together closely. These layers are so close together or

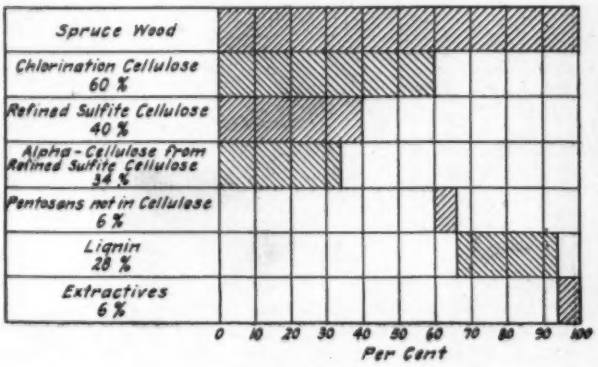
Spruce Wood
Chlorination Cellulose 60 %
Refined Sulfite Cellulose 40 %
Alpha-Cellulose from Refined Sulfite Cellulose 34 %
Pentosans not in Cellulose 6 %
Lignin 28 %
Extractives 6 %
0 10 20 30 40 50 60 70 80 90 100
Per Cent

Fig. 1

**The Different Parts of Spruce Wood that May Be Prepared by Various Treatments.**

else are so embedded in a cementing material of such an index of refraction that the layers are invisible in the original wood. But, by chemical and physical treatments, which the fibers receive through delignification, swelling, and shrinking, the binding material can be removed or the layers can be pushed apart, so that the spacings become visible. The presence of several layers in the cell wall can also be shown plainly by treating delignified fibers with phosphoric acid.

If fibers that have been treated properly with alkali and acid are examined with the aid of a microscope, stratifications that define the various layers can be seen in the cell wall. (Plate 5.) Since the layers form pointed capsules that are nested, complete layers cannot be separated by sliding certain ones endwise over the others, even though they may have been properly loosened. If short sections of such fibers are used, however, it is possible to remove the loosened, concentric, tube-like sections of the layers by sliding them endwise. (Plate 6.)

At present, the chemical composition of the binding material between the various layers in the cell wall is unknown. It may be composed of an easily hydrolyzable portion of the cellulose. The quantity of this substance may be so minute that it will be necessary to determine it by difference in the composition of the residue before and after its removal, rather than to isolate, recover, and identify the binding material itself. This phase of the study will be undertaken later. The accomplishment reported here is the actual separation of the layers in the secondary thickening of the cell wall in wood fibers.

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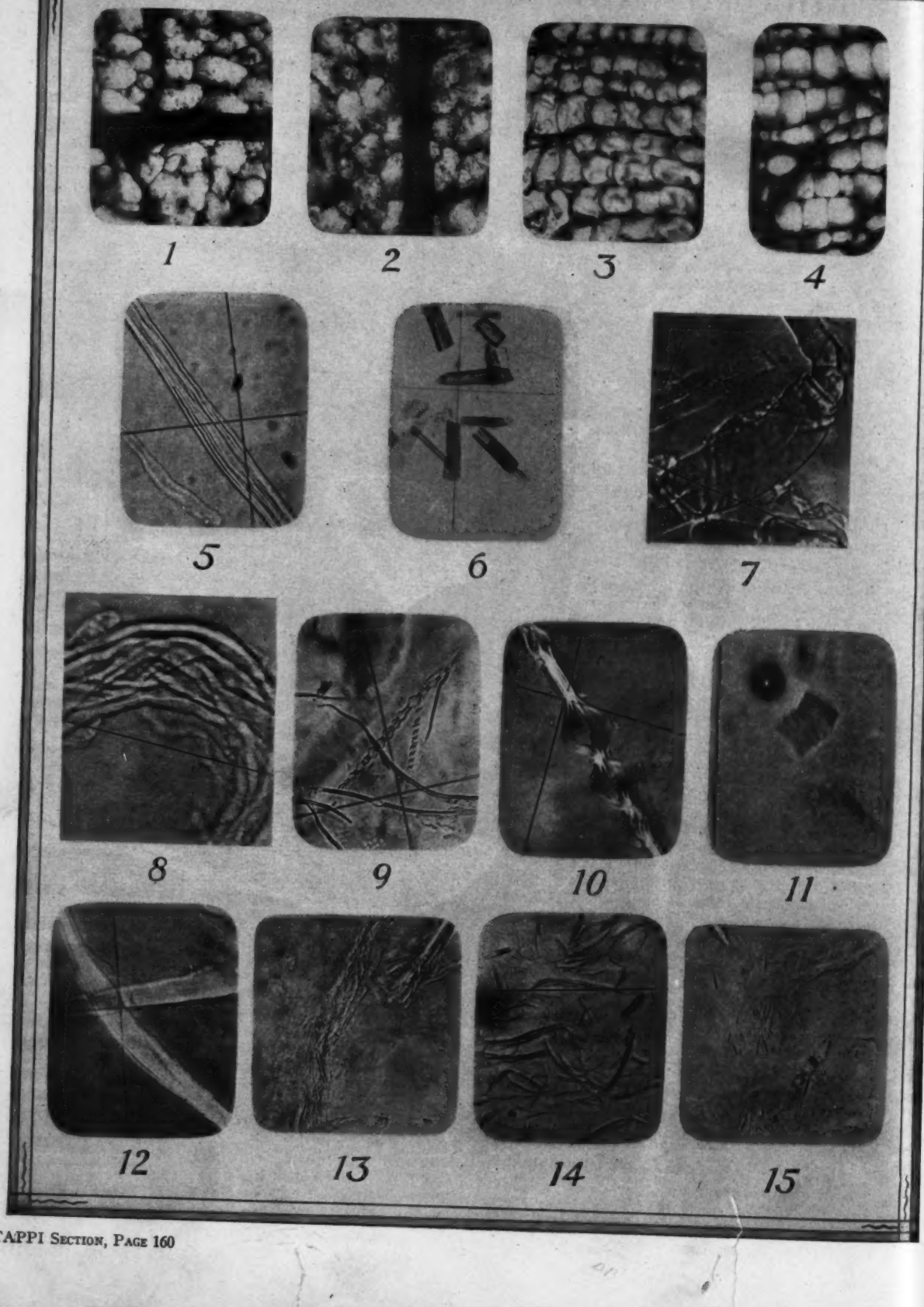
* Presented at Fall Meeting of TAPPI, Wausau, Wis., Sept. 25, 1928.

[1] U. S. Forest Products Laboratory, Madison, Wis. Note:—The authors wish to acknowledge helpful suggestions from Dr. L. F. Hawley, Dr. Eloise Gerry, A. Kohler and M. Y. Pillow of the U. S. Forest Products Laboratory, Madison, Wis.

[2] Ritter, Ind. Eng. Chem. 19, 1194 (1925).

[3] On neutralization of the alkali with dilute acid the wood sections shrink.

[4] Van Iterson, Chem. Weekblad, 24E, 175 (1927).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ORIENTATION AND SEPARATION OF THE FIBRILS IN THE CELL-WALL LAYERS

The swelling properties of bordered pits reported in Part III of this paper, the optical properties observed between Nicol prisms, and the results that will be described in Part II indicate that not only do tiny fibrils form the various layers of the cell wall of wood fibers, but that these fibrils can be separated by chemical means.

The fibrils that compose the outer layers are oriented at approximately 90° to the long axis of the wood fiber. Immediately under the outside layer of some fibers there are occasional stray bands of fibrils wound about the inner layers at approximately 45° to the fiber's axis. Such fibrils do not form a continuous layer. In the remaining layers the fibrils are oriented from 0° to 30° to the axis of the fiber.

A study of the orientation of the fibrils in the various cell wall layers and of the separation of the fibrils in each layer was made by two methods, alkali-acid and phosphoric acid treatments.

(1) ALKALI-ACID METHOD.—After alternate alkali and acid treatments of fibers, faint striations became prominent and more and more striations became visible. In places at which the outer layer had been dissolved, there was extreme outward swelling of the inner layers. Such swelling made apparent the pronounced constrictions at the places where the outer layer was still intact, and also the less prominent constrictions on the fibers that had stray fibril bands wound about their inner layers at an angle of 45°. (Plate 7.) Continued treatment, with the aid of slight pressure on the cover glass, broke the constricting bands and the inner layers separated into fibril bundles. (Plate 8.) It was possible to separate these bundles into individual fibrils, which naturally have a diameter smaller than that of the bundles. Unfortunately, no satisfactory photomicrographs were obtained.

(2) PHOSPHORIC ACID METHOD.—It is possible to control the reaction of the phosphoric acid method upon cellulose better than that of the alkali-acid method. Further, it is possible to reveal the minute structural arrangement of the layers in a manner that cannot be accomplished by the alkali-acid method. Phosphoric acid seems to have a specific property for developing striations in wood fibers by loosening the layers and the fibrils before the skeleton structure dissolves.

Fibers treated by the phosphoric acid method show that solution of the outer layer at intervals is accompanied by extreme outward swelling of the inner layers; such fibers are constricted at the places where the outer layer is still intact. (Plate 9.) Extremely high magnification shows that the cell wall layers separate in the transverse direction. (Plate 10.) Such photographs suggest that the orientation of the fibrils in the outer and in the inner layers is radically different.

Through slowly dissolving the outer layer, it became apparent that striation and separation of the fibrils precede the ultimate solution of the layer as an entirety. Since the fibrils in the outer layer are oriented at approximately 90° to the axis of the wood fiber (plate 11), it is obvious that the fibers cannot swell outwardly beyond the maximum limits that they assume in a water medium, unless the fibrils in the outer layer expand lengthwise or break. Such a structure also accounts for delignified fibers swelling inwardly when the outer layer is still intact. (Plate 18.)

On account of the convexity of the surface of the bead-like swellings in Plate 10, the minute structure of the inner layers is not visible. A swollen surface both flatter and longer must be examined if the tiny fibrils are to be seen in their proper orientation. By proper focusing of the microscope the orientation of the fibrils in the various layers can be studied (Plate 12.) If the acid treatment is continued, the fibrils are loosened to a greater extent. (Plate 13.) By allowing the reaction to proceed still further, the individual fibrils are isolated. (Plate 14.)

If the minute structural arangement of the outer layer is contrasted with that of the inner layers, it will be seen that wood fibers are designed to withstand both transverse and longitudinal stresses.

This separation of the cell wall of the wood fiber into fibrils confirms some findings of Waentig.[5]

SEPARATION OF THE "FUSIFORM BODIES" IN THE FIBRILS

A careful examination of the isolated fibrils from the inner layers of the cell wall under the high power of the microscope revealed that they were made up of units, the ends of which taper to sharp points; the units are held together by a slight overlapping of the pointed ends[6] so as to form the tiny, slender fibrils of a diameter practically uniform throughout their entire length. The long axis of each unit is parallel to the long axis of the fibril. The reaction of the phosphoric acid under proper conditions slowly opens up the natural planes of cleavage between the tiny units, which are of fusiform shape. (Plate 15.) Since, as far as the senior author knows, these are newly discovered units, which have been separated and photographed for the first time in the investigation now reported, they have been given the descriptive name "fusiform bodies."

## III.—Properties of Wood

PHYSICAL PROPERTIES

Some of the swelling properties of wood have been known for a long time through everyday experiences with the increased external dimensions that are produced in wood products when they are changed from dry to wet conditions by soaking in liquids, such as water, and solutions of acids and alkalis. Water swells dry wood approximatedly to its green volume. Strong acids and alkalis swell dry wood beyond its green volume.

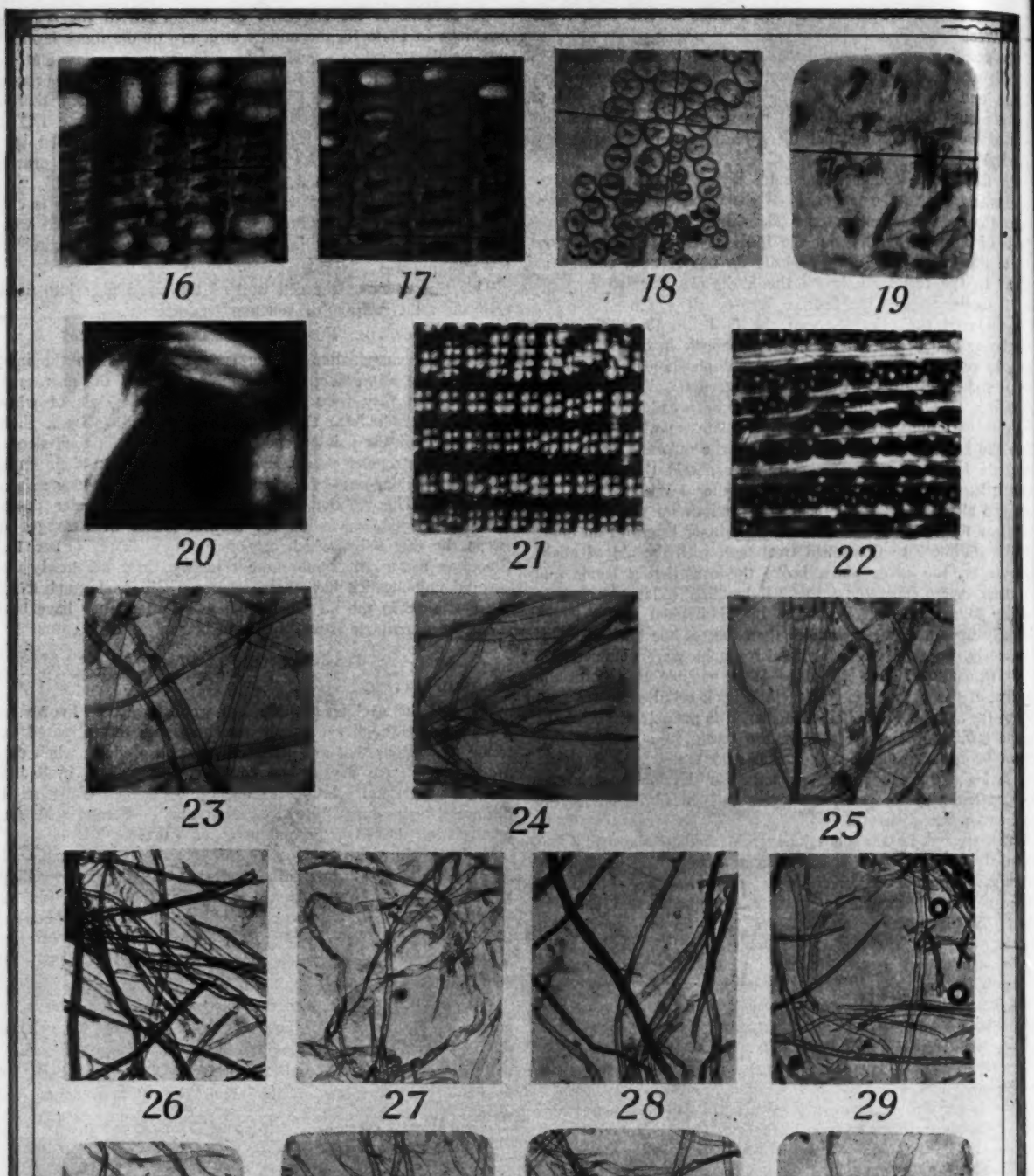
With the aid of a microscope it may be seen that the cell walls of wood also swell internally, and that the internal swelling, when an alkali or a strong acid is used as the reagent, may be sufficiently severe to fill the cell cavities. If a section of wood in its original state is swollen, the fibers retain their external shape, which in cross section shows definite angles. (Plates 16 and 17).

From Plate 17 it is evident that a swollen condition retards the movement of impregnating liquors, prior to cooking, through the pits and the cell cavities. On the other hand, a condition such as that shown in this plate indicates that the fibers have been impregnated by diffusion of the alkali through the actual cell walls. The appearance of the section shown suggests that impregnation of wood chips with alkali liquors takes place princi-

[5] Waentig. Papier-fabrikant 25, 115 (1927).
[6] These units differ from the dermatosomes described by Wiesner in his Elementar Structur, Alfred Hölder, Wien, 1892, p. 162.

LEGENDS FOR PLATES ON OPPOSITE PAGE

Plate 1.—The middle lamella lignin and the cell-wall lignin of rod alder.
Plate 2.—Another transverse section of red alder, which also shows the two forms of lignin. Some of the middle-lamella lignin is slightly out of focus, because of making visible larger quantities of the cell-wall lignin.
Plate 3.—A cross-section cut from a block of yellow-pine middle-lamella lignin, which was first impregnated with paraffin. The rough appearance of the paraffin is due to a slight melting and resolidifying of the paraffin on the surface.
Plate 4.—A cross-section of yellow-pine middle-lamella lignin similar to that of Plate 3. The section shows that the cellulose and the cell-wall lignin can be removed with very little injury to the middle lamella.
Plate 5.—Shows a separation of the delignified cell wall of elm into four distinct layers by means of a 68 per cent solution of phosphoric acid.
Plate 6.—Short sections of delignified elm fibers in which the cell wall layers have been separated and slipped endwise.
Plate 7.—Delignified elm fiber which has received alternated treatments with alkali and acid. The outer layer has been removed from a large portion of the fiber. A helical band at approximately 45 degrees keeps the cell wall from rupturing.
Plate 8.—Delignified elm fiber treated alternately with alkali and acid. Shows a separation of the cell wall into fibril bundles.
Plate 9.—Shows the transverse swelling of the inner layers of elm in places at which the outer layer has been dissolved.
Plate 10.—Shows three separate layers of a delignified elm fiber at the constricted places and the transverse swelling of two inner layers.
Plate 11.—Section of the outside layer, showing helical striations extending around the fiber at right angles to the fiber's axis.
Plate 12.—Shows minute fibrils of the inner cell wall layers. The fibrils have been loosened by phosphoric acid treatment.
Plate 13.—Shows appearance of a fiber after the fibrils have been well loosened.
Plate 14.—Shows a more nearly complete separation of the cell wall layers into fibrils.
Plate 15.—Shows how the "fusiform bodies" into the fibrils can be separated.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pally by diffusion through the cell wall itself rather than through the various natural openings in the wall.

Acid solution of ordinary concentration produce very little swelling of the cell wall beyond its green volume. The orginal sizes of the openings, therefore, remain practically unaltered. Such a condition suggests that impregnation of wood chips with an acid cooking liquor takes place principally through the pits and cell cavities.

If delignified fibers are treated with alkali or with strong acids, they, too, swell by crowding the cell wall into the lumen, but their cross-section area is changed from a polygonal to a circular shape. (Plate 18.) On reacting with the drastic reagents, the fibers become slightly plastic and they tend then to assume shapes that have the minimum external surface in both the transverse and the longitudinal dimensions.

By alternately swelling wood fibers beyond their green volume and then shrinking them quickly, markings are developed that suggest the minute microstructure described in Part II of this paper.

Sodium hydroxide solution (15.6 per cent concentration) was used for swelling the fibers shown in Plate 18. The appearance of those fibers gives an idea of the appearance of wood fibers in cross section after the alkaline treatment in the viscose process, and also in the alphacellulose determination. The numerous pit openings of the swollen cell walls, which do not appear in the photomicrograph, are changed to oblong slits that are practically closed.

Optical properties that suggest the structure of the cell wall about the bordered pits are manifested when the pits are examined in polarized light. It has been known[1] for a long time that the secondary layer of the cell wall rotates the plane of polarized light and that the face of a bordered pit shows the commonly observed dark cross when it is placed between Nicol prisms that are crossed at 90°. The optical properties of the secondary layer are commonly considered to be due to an orderly arrangement of cellulose molecules in chains[2] (Nageli's hypothesis); X-ray diagrams of Sponsler and Dore[3] suggest that these chains are, in general, parallel to the longitudinal axis of the fiber. The fibrils in the secondary layer about the pit are bent around the opening, making their arrangement somewhat circular. The fibrils in the outside layer are present and are oriented at 90° to the fiber's axis. Bending around the opening they superpose a layer of concentric rings over the slight distortions in the circular structure of the inner layers. It is because of this involved total structure that the bordered pits exhibit a symmetrical dark cross through a complete rotation of the microscope stage. (Plates 21 and 22.)

[1] Dippel, "Das Mikroskop," 2, page 264.

[2] Sachs, "History of Botany," page 350.

[3] "Fourth Colloid Symposium," monograph, page 174 (1926).

## IV.—Significance of Fiber Microstructure to Chemical Pulping

Treatments that tend to separate wood fibers into fibrils and, in turn, tend to separate the fibrils into the fusiform bodies, are of interest to the paper maker. If a definite percentage of the fibers in a pulp are in a physical condition similar to the conditions in Plates 5, 6, 7, 11, and 12, it may aid immensely in the felting qualities of the pulp. On the other hand, if the reaction should be carried on sufficiently to put a large percentage of the fibers in the condition shown in Plate 13, the pulp might be useless for making paper.

Further, from the results already presented in this paper, it appears that pulps of different qualities and varying yields, produced by different cooking conditions, should show some difference in the microstructure of the fibers. Also, pulps cooked under the more drastic of the usual commercial conditions might respond more readily to the treatments previously described than pulps cooked under milder conditions. In addition pulps beaten for varying periods might show a tendency to respond to the acid treatments more readily as the beating time increased.

The physical properties of the wood fibers determine to a large degree the ease with which phosphoric acid reacts with the cell wall. A slight rupture of the woody tissues, such as frayed ends, aids in starting the reaction. This fact may be demonstrated by treating short sections of fibers with the acid. With such a section, the solution of the outer layer begins at the frayed ends, and progresses toward the middle. By arresting the reaction before all the outer layer is removed, it is possible to obtain a residue that consists of loosened bundles tied with the spiral bands that form the remainder of the outer layer. (Plate 19.) Such bundles are slightly "broomed" at the ends.

### Optical Properties

Isolated "fusiform bodies," fibrils, and fibril bundles between Nicol prisms exhibit the same property as wood fibers, in that they transmit polarized light when they are oriented at an angle to the axes of the crossed prisms, but do not do so when oriented parallel to either of the axes. (Plate 20.)

The bead-like swelling shown in Plate 10, if placed between Nicol prisms, exhibit a "dark cross" when the axis of the fiber is parallel to the axis of one of the prisms. When the microscope stage is rotated 45°, the dark cross becomes slightly distorted. The bead-like swellings disappear, in general, as spherical bodies with a slight distortion in the direction of the fiber's axis. A cross section of such a body is composed of an approximate circle made up of concentric rings of visible fibrils, which are distorted in a manner similar to that of the swellings. With such a structure the optical phenomenon of the swellings can be explained.

Some tests were made to determine whether such relationships could be shown. Preliminary experimental work was done on two series of sulfite cooks of white spruce and eastern hemlock, respectively. Each series consisted of a pulp showing high strength and high yield in contrast to one showing low strength and low yield. These pulps were subjected to the Laboratory standard strength-development procedure by use of the ball mill. The bleach-abilities of the pulps were also determined. The essential data are recorded in Table 1.

The differences in the two spruce pulps are greater than those

### Legends for Plates on Opposite Page

Plate 16.—Cross-section of western yellow pine soaked in water. Note the general rectangular shape of the cells.

Plate 17.—Cross-section of western yellow pine which has been swollen with 15 per cent alkali. Note the puffy appearance of the surface, the thickening of the cell wall, and the general rectangular shape of the cells.

Plate 18.—Cross-section of western yellow pine which has been delignified so as to obtain isolated cells. On treatment with 15 per cent alkali, the isolated cells assume a cylindrical shape with the lumen closed.

Plate 19.—Short sections of delignified elm fibers, showing the bundle-like residue obtained when the dissolving action of phosphoric acid is arrested before the outer layer is removed completely.

Plate 20.—Shows that the fibrils between Nicol prisms are luminous when oriented at an angle to the axis of either Nicol prism, but dark when parallel thereto.

Plate 21.—Radial face of western yellow pine. The fibers are oriented parallel to the axis of one Nicol prism. The fibers are dark; lines of the "dark cross" are parallel to the corresponding axes of the Nicol prisms.

Plate 22.—Radial face of western yellow pine between Nicol prisms. The fibers are oriented at approximately 45 degrees to the axes of the Nicol prisms. The fibers are luminous; lines of the "dark cross" are parallel to the corresponding axes of the Nicol prisms.

Plate 23.—Spruce sulphite pulp. Pulp 3236; high yield; not milled.

Plate 24.—Spruce sulphite pulp. Pulp 3236; high yield; milled 40 minutes.

Plate 25.—Spruce sulphite pulp. Pulp 3236; high yield; milled 80 minutes.

Plate 26.—Spruce sulphite pulp. Pulp 3236; high yield; not milled; treated with phosphoric acid.

Plate 27. Spruce sulphite pulp. Pulp 3226; low yield; not milled; treated with phosphoric acid.

Plate 28.—Hemlock sulphite pulp. Pulp 3317; high yield; not milled; treated with phosphoric acid.

Plate 29.—Hemlock sulphite pulp. Pulp 3314; low yield; not milled; treated with phosphoric acid.

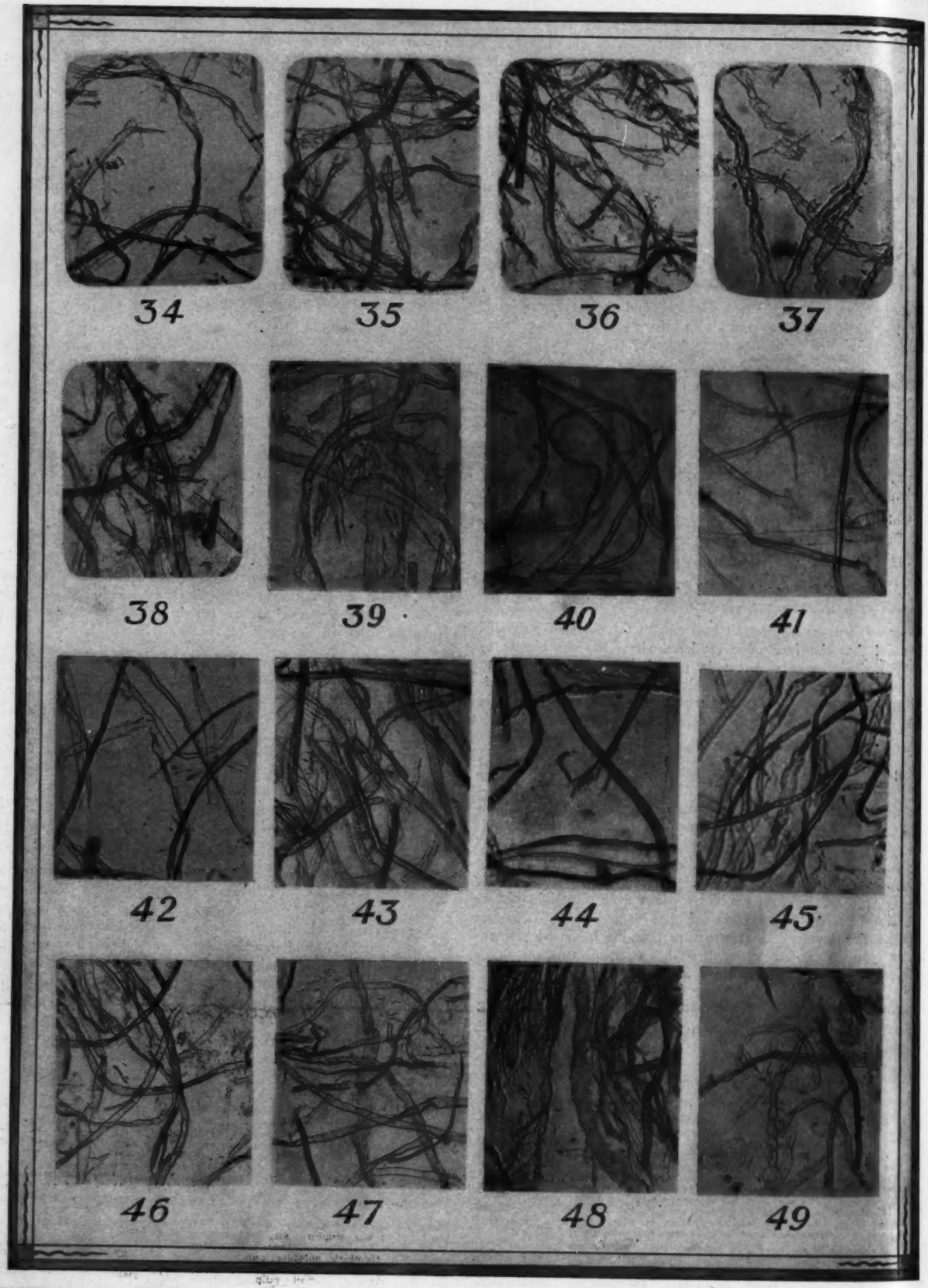
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TABLE 1—STRENGTH AND YIELD CHARACTERISTICS OF EXPERIMENTAL SULPHITE PULPS

| Pulp No. | Species of wood | Yield in per cent of oven-dry weight | Bleach requirement in per cent | Bursting strength Points/lb./ream — Milling time in min. 20 | 40 | 60 | 80 | Tearing strength Grams/lb./ream — Milling time in min. 20 | 40 | 60 | 80 | Folding strength No. double folds — Milling time in min. 20 | 40 | 60 | 80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3226-I | White spruce | 45.2 | 10 | 0.50 | 0.73 | 0.77 | 0.72 | 1.47 | 1.61 | 1.81 | 1.66 | 11 | 48 | 154 | 213 |
| 3236-I | White spruce | 53.8 | 28 | 0.97 | 1.18 | 1.32 | 1.23 | 1.62 | 1.47 | 1.41 | 1.53 | 577 | 1980 | 2280 | 1167 |
| 3314-I | Eastern hemlock | 43.4 | 28 | 0.57 | 0.66 | 0.81 | 0.78 | 2.17 | 2.40 | 2.25 | 2.04 | 47 | 246 | 270 | 289 |
| 3317-I | Eastern hemlock | 46.3 | 28 | 0.72 | 0.86 | 1.02 | 0.96 | 2.10 | 2.45 | 2.13 | 2.00 | 60 | 170 | 612 | 878 |

in the hemlock pulps. In maximum bursting strength, the second spruce pulp is 0.55 point higher than the first; the yield is 8.6 per cent higher. The maximum bursting strength of the second hemlock pulp is 0.21 point higher, while the yield is 2.9 per cent higher than the first.

The spruce pulps were stained with Bismarck brown, air dried, treated with a solution of phosphoric acid, heated for four minutes at 60° C., and cooled. Slides were then made and photomicrographs taken. The hemlock pulps were treated in the same way except that they were heated for three minutes instead of four. In addition, four of the inital samples were treated with a slightly stronger acid, at room temperature, to show more clearly the differences in the fibers before milling. The photomicrographs of these fibers appear in Plates 26, 27, 28, and 29.

Untreated fibers, both milled and not milled, of Pulp 3236-I are shown in Plates 23, 24, and 25. Fibers of the four pulps, milled and not milled and treated with phosphoric acid, are shown in Plates 30 to 49, inclusive.

The results show that pulps prepared under mild cooking conditions are less susceptible to the attack of phosphoric acid than those prepared by drastic cooking conditions. Differences in the susceptibility to the attack appear when plates prepared from the two unmilled spruce pulps and the two unmilled hemlock pulps are compared. For example, contrast Plates 26 and 27; 28 and 29; 30 and 31; and 40 and 41.

The results further show that the binding material and the helical winding of fibrils forming the outer layer of the fiber have been partially or wholly dissolved, allowing the inner portion of the fiber to expand. In some cases, the inner fibrils may be seen slightly separated, forming an extended helix.

The effect of the acid is also noticeable as the milling progresses. When the outer portion of the fiber has been ruptured mechanically, the inner part is attacked by the acid at the rupture and swelling takes place. In the refined pulps, also, the stronger pulp shows, in general, less effect of the acid.

By treating fibers from various sulphite pulps with phosphoric acid and examining them under the microscope, it is possible to observe differences in the quality of the pulp. Just how fine a distinction can be made remains to be worked out. It may be possible to evaluate the pulp numerically by using phosphoric acid solutions of different concentrations, noting the strength at which the pulp is attacked.

Although a rapid qualitative test may be developed from the method, more important is the information it gives on the fundamental relation of the microstructure of the fiber to different cooking conditions, yields, and strength properties.

### Summary

The location in the wood of the two forms of lignin is described. The two forms are shown in photomicrographs.

The possibility of obtaining a yield of 60 per cent of lignin-free fibers for paper material is suggested.

The cell wall of wood fibers is composed of several layers, which can be separated by chemical means.

The layers in the cell wall of a wood fiber can be separated into fibrils by chemical means. The fibrils in the outer layer are oriented at approximately right angles to the fiber's axis, while those in the remaining layers are from 0° to 30° thereto.

The fibrils can be separated into regularly shaped "fusiform bodies" with optical properties similar to those of the fibrils.

When either lignified or delignified wood fibers are treated with swelling reagents, the fiber walls thicken outwardly and also inwardly. The polygonal shape of the cross section of delignified fibers is unaltered, but the cross section of delignified fibers is limited by the outer layer of fibrils, which are oriented at 90° to the fiber's axis.

The optical phenomenon, when bordered pits are observed between Nicol prisms, is explained on the basis of the ring-like structural arrangement of the cellulosic material of the cell wall.

The effect of phosphoric acid on pulps obtained from two series of cooks of spruce and hemlock is described. Its effect is more severe on the pulps from the more drastic cooks, both in the raw and refined condition. The effect increases as the period of milling increases.

The swelling and dissecting action of the phosphoric acid on the fibers is explained on the assumption that part of the outer layer and more of the binding material between the fibrils in the various layers of the cell wall are removed by the more drastic cooking conditions. Milling has the mechanical effect of progressively rupturing the outer layer of fibrils and of loosening the inner fibrils. Such an effect permits a more rapid attack by the phosphoric acid.

It is suggested that the phosphoric acid treatment developed in the study discussed in this paper may be further standardized to provide a new method for the evaluation of pulp quality.

## Would Limit Pulp Wood Cut in Manitoba

If a conference of provincial and Dominion Government officials and mill men, which was held a few days ago at Winnipeg, works out, action by the Dominion Government in the direction of placing a limit on the amount of pulpwood that can be cut from Crown lands will be taken at once. The prospects are that the cut will be confined to the amount that can be marketed in a certain space of time, thus conserving areas for future use which might be laid waste, with the pulpwood held up for an indeterminate period for shipment. Officials of the Dominion Forestry Branch, members of parliament from Northern Manitoba, Saskatchewan and Ontario were present. Some of the delegates wanted the amount of pulp going to the United Stated limited.

LEGENDS FOR PLATES ON OPPOSITE PAGE

Plate 34.—Spruce sulphite pulp. Pulp 3236; high yield; milled 40 minutes; treated with phosphoric acid.

Plate 35.—Spruce sulphite pulp. Pulp 3226; low yield; milled 40 minutes; treated with phosphoric acid.

Plate 36.—Spruce sulphite pulp. Pulp 3236; high yield; milled 60 minutes; treated with phosphoric acid.

Plate 37.—Spruce sulphite pulp. Pulp 3226; low yield; milled 60 minutes; treated with phosphoric acid.

Plate 38.—Spruce sulphite pulp. Pulp 3236; high yield; milled 80 minutes; treated with phosphoric acid.

Plate 39.—Spruce sulphite pulp. Pulp 3226; low yield; milled 80 minutes; treated with phosphoric acid.

Plate 40.—Hemlock sulphite pulp. Pulp 3317; high yield; not milled; treated with phosphoric acid.

Plate 41.—Hemlock sulphite pulp. Pulp 3314; low yield; not milled; treated with phosphoric acid.

Plate 42.—Hemlock sulphite pulp. Pulp 3317; high yield; milled 20 minutes; treated with phosphoric acid.

Plate 43.—Hemlock sulphite pulp. Pulp 3314; low yield; milled 20 minutes; treated with phosphoric acid.

Plate 44.—Hemlock sulphite pulp. Pulp 3317; high yield; milled 40 minutes; treated with phosphoric acid.

Plate 45.—Hemlock sulphite pulp. Pulp 3314; low yield; milled 40 minutes; treated with phosphoric acid.

Plate 46.—Hemlock sulphite pulp. Pulp 3317; high yield; milled 60 minutes; treated with phosphoric acid.

Plate 47.—Hemlock sulphite pulp. Pulp 3314; low yield; milled 60 minutes; treated with phosphoric acid.

Plate 48.—Hemlock sulphite pulp. Pulp 3317; high yield; milled 80 minutes; treated with phosphoric acid.

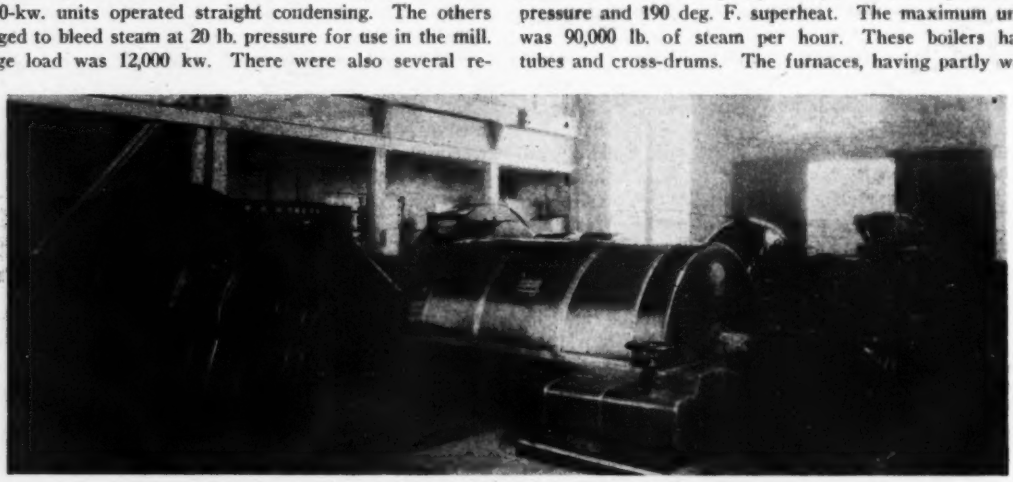
Plate 49.—Hemlock sulphite pulp. Pulp 3314; low yield; milled 80 minutes; treated with phosphoric acid.

# High Steam Pressures in Covington, Va. Mill*

In 1926 the West Virginia Pulp and Paper Company decided to install additional boilers at its Covington, Va., plant to take care of increased production and to replace other boils that were nearing the end of their useful life.

At that time steam was generated in two boiler houses, one containing eleven boilers with a total heating surface of about 65,000 square feet while the other had six boilers of 32,000 sq. ft. total. These were all of horizontal watertube design with economizers and superheaters. The stokers were of underfeed design, burning New River coal. These boilers were operating at 175 to 200 per cent of rating most of the time, and in winter there was little reserve capacity.

Electric current, three-phase, 25-cycle, was generated by six units, five operating at 440 volts and one operating at 6,600 volts to serve remote parts of the plant. Three of the units were rated at 1,500 kw., two at 3,000 kw., and one at 4,500 kw. One of the 1,500-kw. units operated straight condensing. The others were arranged to bleed steam at 20 lb. pressure for use in the mill. The average load was 12,000 kw. There were also several reciprocating engines, driving paper machines and bleach and screen room equipment, that exhausted into the 20-lb. main.



EXTRACTION TURBINE WHICH TAKES STEAM AT 410 LB., EXHAUSTS AT 20 LB., AND EXTRACTS AT 150 LB., SUPPLYING STEAM FOR PAPER MAKING PROCESS

A study developed several methods of meeting the new conditions, which would impose an increased load of 2,500 kw., and at the same time increasing the reserves. These follow:

1. Install additional boiler or boilers in the present boiler houses and push the existing equipment further by means of new stokers, powdered-coal burning or other expedients.

2. Buy outside power and use part of the existing equipment for direct steam at lowered pressures, if necessary.

3. Lay out a completely new plant at a new site, to be constructed in units from time to time as required for plant growth and as the older equipment becomes obsolete.

The studies and estimates showed a number of things: Increasing quantities of 150-lb. and 20-lb. steam would be needed for process work in the future. The larger existing turbines were good for many years of work at good efficiencies within their temperature range. The condenser equipment was sufficient for 12,000 kw. capacity. It would furnish more warm process water than was needed. There was also sufficient capacity to take care of irregularities in power made from process steam. While boiler efficiencies were good, from 10 to 20 per cent better efficiency could be expected from more modern equipment. One-half of the existing boilers, with their furnace equipment, could be counted on for ten years, though not capable of adaptation to higher ratings without undue expense.

Outside power could not compete with power derived from high-pressure steam discharged at process pressures. Existing boiler houses were not large enough to house the additional capacity required. The generation of steam at 425 lb. pressure would require no non-commercial equipment and if the required additional capacity in kilowatts could be manufactured by expanding 425-lb. steam to 150- and 20-lb. pressures, a good heat balance would result, giving additional requirements of 150-lb. steam at a cost of five to ten cents per thousand less than the existing cost. In doing this no additional condenser capacity would be required. It was found further that units to make and utilize about 140,000 lb. of steam per hour could be operated base load with a maximum efficiency and a minimum of control troubles.

In accordance with the third proposal a boiler house was laid out for five units, each of two boilers, ultimate equipment. Each boiler had a normal capacity of 70,000 lb. steam per hour at 425 lb. pressure and 190 deg. F. superheat. The maximum unit capacity was 90,000 lb. of steam per hour. These boilers had inclined tubes and cross-drums. The furnaces, having partly water-cooled walls, were designed for powdered coal firing. Operation was to be normally at 250 per cent of rating, with a maximum of 325 per cent.

The boiler house was designed to be wholly above ground. Boilers were placed in separate settings. The furnace depth was about 23 feet. Side walls, back and bottom were water-cooled. Superheaters of the convection type were selected and located between the first and second pass, the boiler being baffled to give two cross-tube passes.

To recover part of the heat from the gases which leave at from 750 to 800 deg. F., a regenerative air preheater was installed with a small economizer between it and the boiler, so that gases reaching the preheater would not exceed a temperature of 650 deg. F. The preheaters were built with integral induced- and forced-draft fans, driven by turbines taking steam from the 150-lb. main. Between the economizer and preheater a baffle-type dust collector was installed. The gases are discharged from the preheater into a self-supporting steel stack, 9 ft. in diameter and 150 feet high.

Fuel is prepared by unit impact pulverizers, taking coal from an overhead bunker through a distributing weigh-larry and small coal hopper. Coal is brought to the plant and dropped through a trestle to a crusher, thence elevated by a drag chain and sent to a distributing conveyor over the bunkers. All this equipment is motor-driven. No outside coal storage was provided because of the near-by reserve supply of the old plant and the short haul from the mines in a climate not likely to be disturbed by winter storms.

* Power, October 2, 1928.

Burners of the turbulent type were adopted. No ash-handling equipment was provided, as the coal runs less than 5 per cent ash, 80 per cent of which can be expected to go up the stack, thus leaving little to be removed from the furnace bottom.

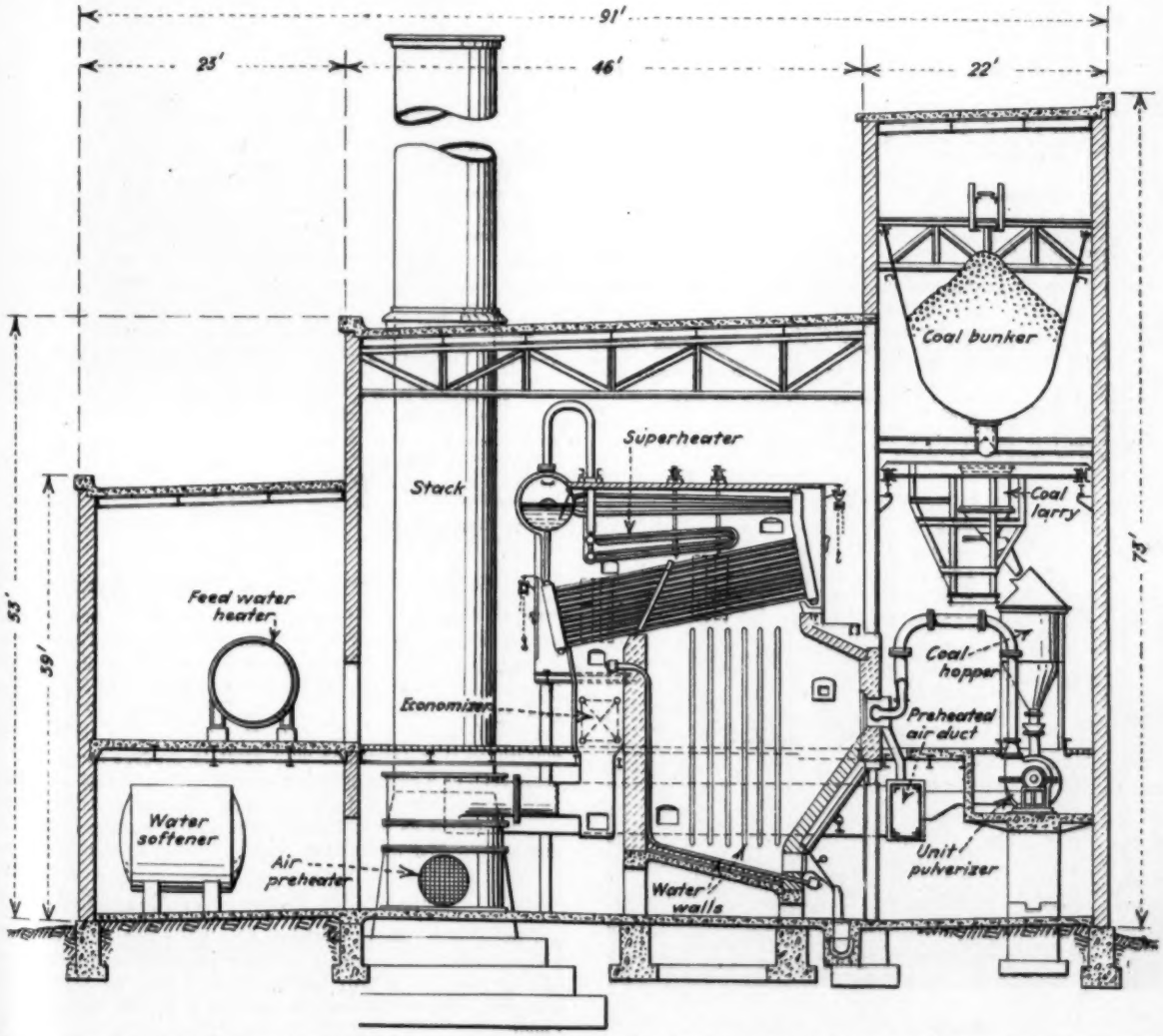
The boilers are fed from river water, running three to five grains per gallon of scale-forming materials. The feed water is settled, filtered twice and then zeolite treated. It then passes to an open heater, which takes steam exhausted by the turbines driving the fans and feed-water pump. Additional steam to bring the water to 210 deg. F. is furnished from the 20-lb. line. Boiler blowoff is continuous, drawing from several points on the water walls and discharging through a heat exchanger.

When motorization of the plant was begun 20 years ago, 25-cycle 440-volt current was adopted. The investment in apparatus of this type had become so large that, when the changes were planned in 1926, it was not deemed advisable to change to 60 cycles. Current at 6,600 volts is used in some remote parts of the plant.

The new power unit is a 5,000-kva. machine, with a 3,600-r.p.m. steam end geared to a 750-r.p.m. generator. This machine is of the extraction type, taking steam at 410 lb., exhausting at 20 lb., and extracting at 150 lb. Its base load, normal operating condition, is 140,000 lb. steam to the throttle, 60,000 lb. through to exhaust, and 80,000 lb. bled. In case one boiler is down, the machine can deliver 3,600 kw. when exhausting 90,000 lb. to the 20-lb. line, with no steam being bled. The machine has no diaphragm, and the proportion of exhaust and extracted steam is regulated by hand.

The new boiler plant went into operation about nine months from the time the decision was made to build, and furnished steam at 150 lb. for the first six months. After the high-pressure turbine was installed, the steam pressure was increased to 415 lb. The plant has been running at the designed pressure for the last six months.

Economic performance has, in general, been about as predicted by preliminary studies. In the two years since construction was begun, there have been numerous improvements in the design of water walls, burning of powedered coal and minor details. Plans are in process and work started on the addition of two more boilers. Some changes will be made from the original design, the need of which has been proved by advances in the art and defects found in the present installation. The major improvements will be as follows: Coal-handling equipment will be speeded up. Coal pulverization will be finer. Somewhat higher superheat will be carried. The water-wall area of the furnaces will be increased, together with circulation pipes. Provision for dust catching will be improved, and several points showing erosion in ducts and stack




Cross-section of The High-pressure Edge-Moor Boilers at Covington, Showing Coal Storage and Preparation Equipment

by ash in the gases will be better protected. The forced- and induced-draft fans will be separated from the preheater. No copper gaskets will be used where they can be reached by treated water. Control of the feed water will be improved.

### Another High-Pressure Turbine Purchased

In addition to the two new boilers in the second unit, another 4,500-kva. high-pressure turbine has been bought, virtually a duplicate of the present one, except that it has a diaphragm and grid valve. This insures greater flexibility and permits of full capacity when sending virtually no steam to the 20-lb. exhaust.

In the table are given average figures covering the monthly performance of the boilers. There is also appended a list of the principal mechanical equipment installed for the 1926-27 improvement. The design of the plant was worked out by the engineering department of the company, in collaboration with H. S. Ferguson, consulting engineer, of New York City. The construction was handled by the local engineering and construction force at the mill at Covington.

TYPICAL MONTHLY PERFORMANCE
400 LB. BOILERS

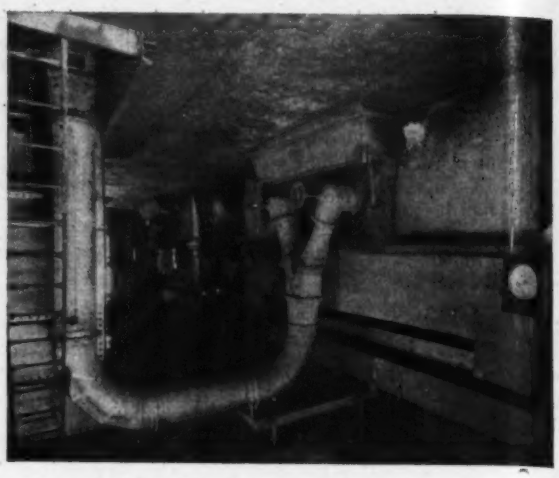
| | |
|---|---|
| Number of boilers in service | 2 |
| Operating hours | 568 |
| Pounds of coal, as fired, per hour | 13,300 |
| Coal Analysis: | |
| Fixed carbon, per cent | 74.19 |
| Volatile, per cent | 21.61 |
| Ash, per cent | 4.20 |
| Moisture, per cent | 2.48 |
| Sulphur, per cent | 66 |
| B.t.u. dry basis | 14,956 |
| Evaporation, lb. per hour | 146,200 |
| Evaporation per lb. coal as fired, lb. | 10.99 |
| Steam pressure, lb. | 415 |
| Superheat, deg. | 175 |
| Temp. feed water entering economizer, deg. | 205 |
| Equivalent evaporation, lb. per hour | 172,600 |
| Equivalent evap. per lb. coal as fired, lb. | 12.98 |
| Temp. gases leaving economizers, deg. | 505 |
| Temp. gases leaving preheaters, deg. | 300 |
| Temp. air entering preheaters, deg. | 80 |
| Temp. air leaving preheaters, deg. | 380 |
| Per cent $CO_2$ | 14.6 |
| Pulverization: | |
| Through 200-mesh, per cent | 75 |
| On 50-mesh, per cent | 1.6 |
| Percent efficiency boilers, superheaters, economizers and preheaters | 86.3 |

MAKERS OF PRINCIPAL MECHANICAL EQUIPMENT IN 1926 EXTENSION

*Boilers and Auxiliaries*

2—Edge-Moor Iron Co., 425 lb. pressure, 8,250-sq.ft. cross-drum boilers, with 710 sq. ft. of water-wall
2—Foster convection superheaters, designed to give 190 deg. F. superheat
2—Foster-Wheeler, 1,728-sq.ft. economizers.
2—Diamond Power Specialty Corp. soot blowers, six units per boiler.
Boiler arches, M. H. Detrick Co.
Firebrick, Harbison-Walker Refractories Co.
2—Ljungstrom C-16 air preheaters, induced- and forced-draft fans integral. Driven by Terry steam turbines.

NEW POWER HOUSE AT COVINGTON



FRONT OF THE BOILERS, SHOWING POWDERED COAL BURNERS AND FEED PIPES

*Miscellaneous Material and Equipment*

Boiler non-return valves, Elliot Co.
Turbine non-return valves, Schutte-Koerting Co.
400-lb. valves, Walworth Co.
250-lb. valves, Crane Co.
400-lb. pipe and fittings, N. W. Kellogg Co.
250-lb. pipe and fittings, Walworth Co.
Water-wall piping, M. W. Kellogg Co.
Feed-water regulators, Swartwout Co.
Ash gates, Beaumont Mfg. Co.
Gas flues and air ducts, Tippet & Wood.
Stack, Mead Penn Co.
Covering, Robert A. Keasby Co.
Steelwork, Pittsburgh Bridge & Iron Co., F. M. Weaver Co.

*Coal-Handling Equipment*

1—American Pulverizer Co. ring crusher No. 42, capacity 150 tons per hour
1—Webster Mfg. Co. 5-ton traveling weigh-larry
2—Simplex type 4-A unit pulverizers. Capacity 8,000 lb. per hr. each
4—Combustion Engineering Corp. turbulent type burners

*Boiler-Feed System*

2—Permutit Zeolite water softeners. Maximum capacity 25,000 gallons per hour each.
3—Dean Hill Pump Co., 750-g.p.m. boiler-feed pumps, driven by Terry steam turbines
1—Elliott Co. type E open feed-water heater
Permutit continuous blowdown system, with heat exchanger

*Turbines*

1—General Electric Co. 4,000-kw., 3,600 r.p.m. turbine, geared to a 500 r.p.m. 3-phase, 25-cycle, 440-v., 5,000-kva. generator. Steam at throttle 415-lb. gage, 190 deg. F. superheat. Turbine arranged to extract at 150 lb. and exhaust at 20 lb. Hand regulation of 150 lb. and 20 lb. steam by gate valves on 150- and 30-lb. outlets.

*Instruments*

Flow meters, Republic Flow Meters Co.
Boiler meters, Bailey Meter Co.
Draft gages, Paul B. Huyette Co.
Indicating thermometers, The Foxboro Co.
Mercury thremometers, C. J. Tagliabue Mfg. Co.

*Electrical Equipment*

Motors, General Electric Co.
Switchboard, Westinghouse Elec. & Mfg. Co.

## Magnuson and Nilsson Visiting America

G. E. Magnuson, director of Skonviks A. B., and a member of TAPPI, and Holger A. E. Nilsson, director of Kopparberg & Hofors Sagverks A. B. of Sweden, are visiting the important pulp producing centers in the United States. At Mr. Nilsson's mill sulphite waste liquor is utilized as follows: The liquor as drained from the pulp is evaporated to one-third of its volume whereupon it is fermented with yeast to produce acetic acid and lactic acid, as a result of which operation one-third of the remaining liquor is removed by evaporation. The final residue is used to some extent as a fuel and a considerable portion is used as a dust preventative on Swedish roads. A small amount is exported.

## Paper Index Number for September

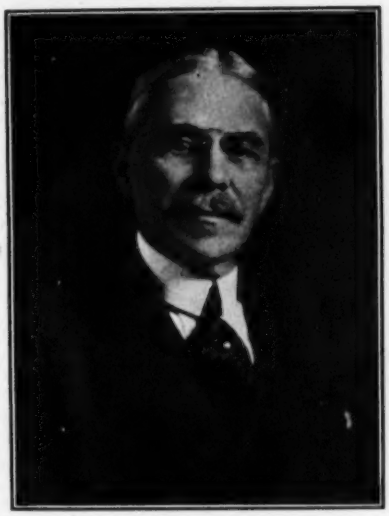
WASHINGTON, D. C., October 24, 1928.—The wholesale price index number for the paper and pulp industry for September was 88.8 compared with 88.8 for August and 92.4 for September of last year, taking 1926 at 100, according to the Department of Labor.

# Obituary

## William F. Etherington

William Fisher Etherington, president of the firm bearing his name, passed away quietly at his residence, 430 Park Avenue, New York, on October 12, after a long illness. He had not been at his office since early in February. The death of W. F. Etherington removes an outstanding figure from the paper industry and one who truthfully may be termed the Dean of the Trade in New York, in which city he spent his entire business life.

Mr. Etherington was born on August 1, 1854, in Brooklyn, then a separate city of some 250,000. He attended the public schools and later the Brooklyn Polytechnic Institute, leaving there at the age of sixteen to enter the employ of H. C. Hulbert & Co. as an office boy. Mr. Hulbert soon recognized his latent business ability and placed him on the sales force. After several years under Mr. Hulbert, to whose careful training Mr. Etherington always attributed part of his success, he took a salesman's position with Miller & Flinn, becoming in a few years their head salesman.



WILLIAM F. ETHERINGTON

On January 1, 1890 he started in business for himself under the name of W. F. Etherington & Co., his first office being in the old American Tract Society Building on Nassau street. Three years later he admitted to partnership the late A. G. Hapgood and the firm name was changed to Etherington & Hapgood. Upon the withdrawal of Mr. Hapgood two years later the original firm name was readopted and has been continued ever since.

Mr. Etherington's success in the industry is attested to by the fact that at the time of his demise many of his customers were the same concerns he had sold steadily from the time he started his own business.

A noteworthy incident in his business life was a dinner given in his honor on the Fiftieth Anniversary of his entrance into the paper industry, at the University Club, New York, by leaders of the publishing trade in New York and Boston and by prominent paper manufacturers with whom he had done business for many years.

He outlived nearly all his contemporaries in the trade. It was a rare treat to hear his reminiscences of the early days of paper selling, when wood paper was unknown and books were perforce printed on all-rag stock. He made himself a commanding figure in the industry and his genial and forceful personality will be sorely missed by a host of friends in and out of the paper trade.

In 1882 he married Grace Garland of Biddeford, Maine, who survives him with a daughter, Elizabeth, and a son, Sandford Garland, the latter having been connected with the firm for the past twenty years.

Mr. Etherington was a member of the Chamber of Commerce of New York, the Princeton Club of New York, the Players and the Automobile Club of America.

## Donald Eibel

RHINELANDER, Wis., October 17, 1928.—Donald Eibel, the only son of Mr. and Mrs. William Eibel, died October 10, at Rhinelander, Wis., from the result of an automobile accident.

Mr. Eibel, in company with Gene Kabel, Buick dealer in Rhinelander, was driving to Rhinelander in a light car. The radius rod dropped causing the car to turn over. Mr. Eibel's head was badly fractured and Mr. Kabel suffered a slight concussion. Mr. Kabel is still in the hospital and it is thought he will recover.

Donald Eibel was born in Rhinelander on April 28, 1905, and lived practically all of his life in Rhinelander with the exception of a few years residence in California and Michigan. He was graduated from the Menominee, Mich. High School and spent two years at Leland Stanford and the University of Southern California.

At the time of his death he was employed by the Rhinelander Paper Company and was preparing to go to the Pacific Coast with his father, who has accepted the post of secretary and treasurer of the Fir-Tex Insulating Board Company, Portland, Ore. William Eibel, his father, has been manager and treasurer of the Rhinelander Paper Company for the past twenty years.

Donald Eibel was loved and respected by all who knew him and has left behind a lasting memory of his many fine qualities. Friends and business associates from all parts of the United States have sent messages of sympathy to the bereavey father and mother.

## Isaac H. Weldon

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 24, 1928.—Isaac H. Weldon, prominent in the pulp and paper industry of Canada, president of Provincial Paper, Ltd., vice-president and treasurer of the Interlake Tissue Mills, Ltd., a founder of the Canadian Pulp and Paper Association, financier, farmer and philanthropist, died at his residence in Toronto a few days ago of heart trouble, following only two weeks' illness. He was one of the best known captains of the pulp and paper industry in Canada and his rather sudden death came as a distinct shock to the business world of Toronto and the Dominion.

A native son of Canada and of Irish extraction, Mr. Weldon enjoyed a brilliant career and achieved great triumphs in the realm of industrial enterprise during his fifty-three years of life. His sudden passing just at the zenith of his fame and influence is deeply regretted by his business confreres and many friends. Born in Darlington township, near Bowmanville, Ont., and educated in the public and high schools, he decided to take up the study of medicine, but after one term at the University of Toronto, abandoned the idea and embarked upon a strictly commercial career in which he was preeminently successful.

His first position was with the E. B. Eddy Company, of which his brother, T. H. Weldon, vice-president of Provincial, was branch manager. He was with that company for eight years and acquired a thorough practical knowledge of the paper business in all its ramifications. Upon the foundations thus laid, he started to build his career, taking a position with the Laurentide Paper Company for a short period, then going to the United States to assume important duties with the Burgess Sulphite Company, of Portland, Maine, and Boston, Mass., returning to Canada in 1909.

Back in his native land, he assisted in the organization of the St. Lawrence Paper Mills Company, in the acquisition of the business of the Barber Paper Company and in the founding of the Interlake Tissue Mills, Ltd., three concerns controlling the largest portion of the manufacture of book, bond, writing, coated and tissue paper in the Dominion.

As one of the founders of the Canadian Pulp and Paper Association, Mr. Weldon did a fine piece of work, although he himself was rarely in the lime light and was content to make his influence felt from the obscurity of a back seat. His extensive business connections through his successful organization and operation of the old Provincial Paper Mills, Ltd., necessitated his traveling to and from all parts of Canada, and during his visits to the Western provinces he became interested in farming, acquiring and operating successfully a large farm near Edmonton, Alta.

He took a deep interest in boys' work and in the welfare of children. He was a trustee of the Sick Childrens Hospital in Toronto and was on the management board of the Boys' Industrial Home, Bowmanville. His other activities included membership in the Board of Trade, Canadian Manufacturers' Association, the National Club, the Royal Canadian Yacht Club, Summit and Lake View Golf Clubs and a supporter of the Toronto Playgrounds Association. Mr. Weldon is survived by his wife, formerly Miss Georgia Jones, three sisters and two brothers. One of the brothers, T. A. Weldon, is vice-president of Provincial Paper, Ltd., at the head office in Toronto.

The funeral from the family residence in Cluny place, on October 19, was attended by prominent business men from most parts of Canada, including officials of the Canadian Pulp and Paper Association and representative mill men from most of the big paper manufacturing companies throughout the Dominion.

### M. Fauville

CARTHAGE, N. Y., October 1, 1928.—M. Fauville, chemist at the plant of the Champion Paper Company, died suddendly Tuesday afternoon. He was taken suddenly ill while on the way home from the mill. Heart disease was the cause of death. He was 66 years old.

Mr. Fauville was a native of Canada and spent practically his entire life in paper mill work. He has been identified with the Carthage mill for several years. The survivors include his wife, three sons and two daughters.

## M. Gottesman Appointed Agents

M. Gottesman & Co., Inc., announce their appointment as exclusive agents in the United States for the Hylte Bruks Aktiebolag, owners of the Rydo sulphite pulp mills.

The Rydo mill manufactures about 15,000 tons per year of indirect, cooked strong unbleached sulphite which is very favorably known in this market. Recent additions and changes at the mill have resulted in the manufacture of an improved quality which is being received with marked approval by all its users.

M. Gottesman & Co., Inc., who were established in 1886, have for over forty years specialized in Scandinavian wood pulps and they maintain their own offices at Gustavs Adolfs torg 14, Stockholm, Sweden. They are large importers of all grades of sulphite and kraft pulps and handle the majority of the output of some of the best known Scandinavian and European mills.

## Fire at Terre Haute Paper Plant

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 9, 1928.—Fire at the Sixteenth street plant of the Terre Haute Paper Company, Terre Haute, Ind., recently caused a second alarm to be sent in with the result that all the fire fighting equipment, except two companies were called to the scene. All the damage was done to the huge bales of straw stored on the premises, but officials of the company said it would be impossible to estimate the damage, though it will be considerable. W. G. Clark, president of the company, expressed the opinion that the fire was of incendiary origin, as it had caught at one of the rear corners of the north straw stack, where there was no one around and at a point farthest from the Pennsylvania railroad lines, eliminating sparks as a cause. One stack, worth about $6,500, was badly damaged.

## May Operate Mercantile Plant Without Change

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, October 15, 1928.—Howard F. Marston, president of the Mercantile Corporation, arrived home the past week after a prolonged stay in New York City in conference with the new officers of the International Envelope Corporation of that city, which recently purchased the plant of the Mercantile at East Third and Front streets.

It is understood the purchasers plan to operate the Mercantile plant without material change in personnel, and to fulfill its newly-closed contract for furnishing United States Government stamped envelopes and newspaper wrappers.

This contract extends for a period of four years and involves more than $13,000,000 for that period. The Mercantile Corporation, a subsidiary of the Mid-West Company, has been filling the contract for a period of years and the industry has proved to be one of the most substantial in this community.

A large force of men and women is employed at the Front street plant and Mr. Marston's return from the East with the definite information the plant will be continued uninterruptedly in Dayton, is the best news the Chamber of Commerce has disseminated for some time.

Owing to the closing of the vast contract by the International Envelope Company, which in all likelihood will obtain its paper from its own mills, unless plans are changed, it was feared for a time that the manufacturing branch of the industry might be transferred.

When a Dayton realty firm obtained an option on a factory building for the manufacture and printing of the envelopes and wrappers, however, it seemed certain the successful bidders intended to keep the plant in Dayton, owing not only to its proximity to raw products but its central location in the distribution of the finished products.

## Joins Staff of M. Gottesman & Co.

Harry W. Draudt, who has had many years experience in the sale of wood pulp, has joined the sales staff of M. Gottesman & Co., Inc., Central National Bank Building, New York City.

Arthur J. Sigel, vice-president and general manager of sales of M. Gottesman & Co., Inc., in announcing Mr. Draudt's new association, said that their company was doing an enormous volume of business and the enlargement of their sales staff has become necessary in order to take care of the very satisfactory and continued growth of their business.

Mr. Sigel has the unique distinction of a trans-Atlantic telephone conversation when he recently talked with the M. Gottesman & Co., Inc., office in Stockholm. Mr. Sigel reports he heard Stockholm with the clarity of an inter-office telephone conversation and stated that he would be prepared to entrust to the trans-Atlantic telephone the negotiation of similar important transactions as the one which was closed when Mr. Sigel talked to Stockholm.

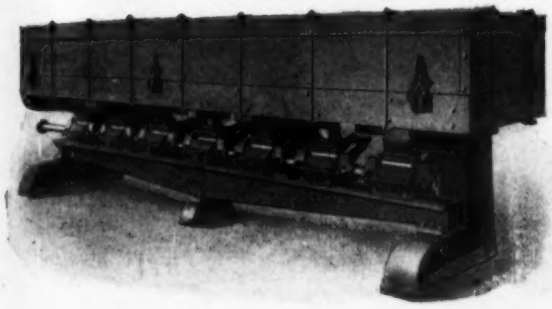
## Michigan Superintendents Elect Officers

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., October 22, 1928.—All officers of the Michigan Division of the American Pulp and Paper Mill Superintendents Association are retained in their respective positions as result of the annual election, held Thursday evening, following dinner at the Park-American Hotel. The incumbents are: President, Michael Redmond, Kalamazoo Paper Company; first vice president, Clarence Harter, Watervleit Paper Company; second vice president. William Sievert, Michigan Carton Company, Battle Creek; third vice president, Walter Crawford, Sutherland Paper Company; secretary-treasurer, George Pountain, Bryant Paper Company.

Frank B. Eilers, of the Orr Felt and Blanket Company, Piqua, Ohio, gave an illustrated talk on the manufacture of paper mill felts.

# Quality Pulp



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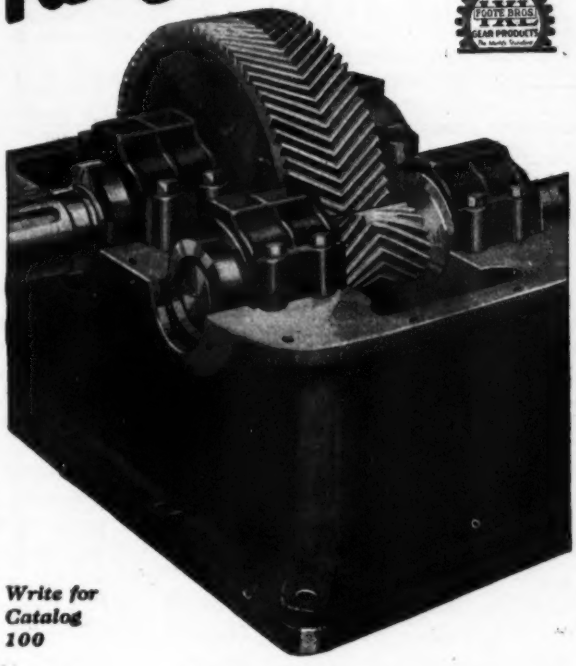

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10-28

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# Imports of Paper and Paper Stock

## NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

## NEW YORK IMPORTS

WEEK ENDING OCTOBER 20, 1928

### SUMMARY

Cigarette paper .....159 cs.
Wall paper .....2 bls., 30 cs.
Paper hangings .....61 bls., 26 cs.
News print .....1591 rolls
Printing paper .....279 rolls, 116 bls., 70 cs.
Wrapping paper .....87 cs.
Packing paper .....60 bls., 6 cs.
Drawing paper .....97 cs.
Filter paper .....14 cs.
Surface coated paper .....14 bls., 107 cs.
Metal coated paper .....30 cs.
Baryta coated paper .....51 cs.
Gold coated paper .....5 cs.
Photo paper .....4 cs.
Stencil paper and ink .....41 cs.
Cover paper .....5 cs.
Transfer paper .....1 cs.
Silk paper .....2 cs.
Greaseproof paper .....16 cs.
Colored paper .....22 cs.
Decalcomania paper .....33 cs.
Tissue paper .....114 cs.
Writing paper .....1 cs.
Cellophane paper .....2 cs.
Miscellaneous paper .....1900 rolls, 706 bls., 69 cs.

### CIGARETTE PAPER

Standard Products Corp., Ile de France, Havre, 40 cs.
P. J. Schweitzer, Pr. Monroe, Marseilles, 62 cs.
British American Tobacco Co., Homeric, Southampton, 57 cs.

### WALL PAPER

Bendix Paper Co., New York, Hamburg, 23 cs.
J. E. Bernard & Co., New York, Hamburg, 2 bls.
American Exchange Irving Trust Co., New York, Hamburg, 7 cs.

### PAPER HANGINGS

A. C. Dodman, Jr., Inc., Franconia, Liverpool, 4 bls.
W. H. S. Lloyd & Co., Franconia, Liverpool, 11 bls.
A. C. Dodman, Jr., Inc., Cedric, Liverpool, 25 bls.
Whiting & Patterson Co., Inc., Minnetonka, London, 12 cs.
W. H. S. Lloyd & Co., Minnetonka, London, 21 bls., 7 cs.
Whiting & Patterson Co., Inc., Homeric, Southampton, 3 cs.
Whiting & Patterson Co., Inc., Aquitania, Southampton, 4 cs.

### NEWS PRINT

Hudson Trading Co., Stavangerfjord, Honefors, 95 rolls.
Ossian Ray, Drottningholm, Gothenburg, 63 rolls.
Parsons & Whittemore, Inc., Berlin, Bremen, 616 rolls.
Gilman Paper Co., Korsholm, Norrkoeping, 644 rolls.
Brooklyn Times, Korsholm, Stockholm, 74 rolls.
Hudson Trading Co., Korsholm, Wifstavarf, 99 rolls.

### PRINTING PAPER

National City Bank, New York, Hamburg, 116 bls.
E. Dietzgen & Co., New York, 21 cs.
Sinclair & Valentine Co., New York, Hamburg, 4 cs.
J. J. Shore, New York, Hamburg, 14 cs.
Keuffel & Esser Co., New York, Hamburg, 32 rolls.
Judson Freight F'd'g Co., Stuttgart, Bremen, 25 cs.
Steffens Jones Co., Stuttgart, Bremen, 5 cs.
H. Reeve Angel & Co., Inc., Malmen, Wiborg, 247 rolls.
G. W. Sheldon & Co., Homeric, Southampton, 1 cs.

### WRAPPING PAPER

Birn & Wachenheim, Arabic, Antwerp, 87 cs.

### PACKING PAPER

Steiner Paper Corp., Stavangerfjord, Oslo, 60 bls., 6 cs.

### DRAWING PAPER

Keuffel & Esser, New York, Hamburg, 91 cs.
Devoe & Reynolds Co., Lancastria, London, 6 cs.

### FILTER PAPER

H. Reeve Angel & Co., Inc., Lancastria, London, 14 cs.

### SURFACE COATED PAPER

Hensel, Bruckman & Lorbacher, New York, Hamburg, 9 cs.
Phoenix Shipping Co., New York, Hamburg, 1 cs.
Quality Art Novelty Co., New York, Hamburg, 13 bls., 2 cs.
Globe Shipping Co., New York, Hamburg, 1 ble.
Gevaert Co. of America, Arabic, Antwerp, 95 cs.

### METAL COATED PAPER

Hensel Bruckman & Lorbacher, New York, Hamburg, 1 cs.
Hensel Bruckman & Lorbacher, Berlin, Bremen, 29 cs.

### BARYTA COATED PAPER

J. H. Schroeder Banking Corp., Stuttgart, Bremen, 51 cs.

### GOLD COATED PAPER

F. Murray Hill, Berlin, Bremen, 5 cs.

### PHOTO PAPER

J. J. Gavin, Franconia, Liverpool, 3 cs.
Medo Photo Supply Corp., Minnetonka, London, 1 cs.

### STENCIL PAPER AND INK

Arlac Dry Stencil Corp., New York, Hamburg, 41 cs.

### COVER PAPER

International F'd'g Co., New York, Hamburg, 5 cs.

### TRANSFER PAPER

Schmidt & Pritchard, New York, Hamburg, 1 cs.

### SILK PAPER

Globe Shipping Co., New York, Hamburg, 2 cs.

### GREASEPROOF PAPER

American Express Co., New York, Hamburg, 16 cs.

### COLORED PAPER

P. H. Petry, Stuttgart, Bremen, 12 cs.
J. Beckhard, Berlin, Bremen, 10 cs.

### DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Franconia, Liverpool, 9 cs. (duplex) 15 cs. (simplex).
C. W. Sellers, Berlin, Bremen, 3 cs.
L. A. Consmiller, Berlin, Bremen, 6 cs.

### TISSUE PAPER

F. B. Vandegrift & Co., Franconia, Liverpool, 10 cs.
B. F. Drakenfeld & Co., Franconia, Liverpool, 1 cs.
J. E. Bernard & Co., Franconia, Liverpool, 3 cs.
Sneyd Mills Color Co., Franconia, Liverpool, 1 cs.
Old Master Paper & Pulp Corp., Reliance, Hamburg, 99 cs.

### WRITING PAPER

M. J. Corbett & Co., Aquitania, Southampton, 1 cs.

### CELLOPHANE PAPER

M. J. Corbett & Co., Aquitania, Southampton, 2 cs.

### MISCELLANEOUS PAPER

D. S. Walton & Co., Stuttgart, Bremen, 32 bls.
C. K. MacAlpine & Co., Drottningholm, Gothenburg, 135 bls.
G. W. Sheldon & Co., Ile de France, Havre, 21 cs.
Guibout Freres, Ile de France, Havre, 9 cs.
Standard Products Corp., Ile de France, Havre, 22 cs.
Keller Dorian Paper Co., Ile de France, Havre, 12 cs.
H. D. Catty & Co., Ile de France, Havre, 1 cs.
Walker Goulard Plehn Co., Berlin, Bremen, 177 bls.
Arkell Safety Bag Co., Argosy, Gothenburg, 440 rolls.
The Borregaard Co., Inc., Argosy, Gothenburg, 332 bls., 1,356 rolls.
Gilbert Paper Co., Argosy, Gothenburg, 104 rolls, 30 bls.
P. H. Petry & Co., Reliance, Hamburg, 4 cs.

### RAGS, BAGGINGS, ETC.

American Exchange Irving Trust Co., New York, Hamburg, 119 bls. rags.
A. W. Fenton, Inc., New York, Hamburg, 105 bls. rags.
Chase National Bank, Fred. VIII, Copenhagen, 211 bls. rags.
Amtorg Trading Co., Fred. VIII, Copenhagen, 227 bls. rags.
Union Bank & Trust Co., Stuttgart, Bremen, 126 bls. rags.
Whaling Waste Products Co., Cameronia, Glasgow, 36 bls. paper stock.
Equitable Trust Co., Franconia, Liverpool, 35 bls. rags.
J. Cohen Son & Co., Franconia, Liverpool, 21 bls. rags.
Bank of The Manhattan Co., Franconia, Liverpool, 21 bls. rags.
M. Snedeker Corp., Franconia;, Liverpool, 61 bls. paper stock.
E. J. Keller Co., Inc., Sinsinawa, ——, 30 bls. linen and hemp threads.
V. Galaup, Sinsinawa, Naples, 59 bls. rags.
A. C. Fetterolf, Cedric, Liverpool, 51 bls. rags.
M. Lobsitz, Cedric, Liverpool, 28 bls. rags.
State Bank & Trust Co., Cedric, Liverpool, 9 bls. rags.
E. Butterworth & Co., Inc., Cedric, Liverpool, 82 bls. bagging.
E. J. Keller Co., Inc., Minnetonka, ——, 117 bls. linen thread.
Gallagher & Ascher, Minnetonka, London, 80 bls. rags.
Darmstadt Scott & Courtney, Rigel, Barcelona, 138 bls. bagging.
E. Butterworth & Co., Inc., Rigel, Barcelona, 76 bls. rags.
Union Bank & Trust Co., Rigel, Alicante, 156 bls. rags.
Darmstadt Scott & Courtney, Rigel, Malaga, 76 bls. rags.
E. J. Keller Co., Inc., City of St. Joseph, ——, 76 bls. rags.
American Over-Ocean Corp., Calcutta Mara, Kobe, 83 bls. rags.
French American Banking Corp., Ontario, Havre, 32 bls. new cuttings.
Royal Manfg. Co., Ontario, Havre, 103 bls. threads.
Chemical National Bank, Ontario, Havre, 230 bls. rags.
E. J. Keller Co., Inc., Sac City, Antwerp, 245 bls. flax waste.
A. W. Fenton, Inc., Sac City, 111 bls. rags.
Merchants National Bank, Patagonier, Antwerp, 41 bls. rags.
Union National Bank, Patagonier, Antwerp, 114 bls. rags.
National City Bank, Patagonier, Antwerp, 77 bls. rags.
Brown Bros. & Co., Patagonier, Antwerp, 15 bls. rags.
E. J. Keller Co., Inc., Patagonier, ——, 56 bls. rags.
E. J. Keller Co., Inc., Zeriba, ——, 145 bls. rags.

### OLD ROPE

American Exchange Irving Trust Co., New York, Hamburg, 58 coils.
Amtorg, Ltd., Fred. VIII, Copenhagen, 190 coils.
E. J. Keller Co., Inc., Fred. VIII, ——, 49 coils.
Brown Bros. & Co., Stavangerfjord, Oslo, 40 coils.
Brown Bros. & Co., Minnetonka, London, 92 coils.
Kidder Peabody Accep. Corp., Rigel, Marseilles, 70 coils.
Brown Bros. & Co., Cabo Torres, Bilbao, 405 rolls.

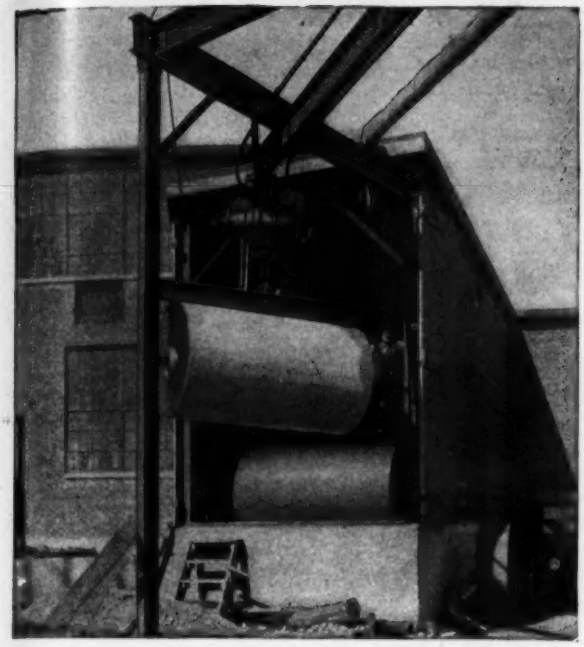
### WOOD PULP

Castle & Overton, Inc., New York, Hamburg, 387 bls. wood pulp, 58 tons.
Atterbury Bros., Inc., Stavangerfjord, Oslo, 750 bls. wood pulp, 73 tons.
International Accep. Bank, Stavangerfjord, Oslo, 800 bls. wood pulp.
Chase National Bank, Stavangerfjord, Oslo, 400 bls. sulphite pulp.
E. M. Sergeant & Co., Drottningholm, Gothenburg, 299 bls. dry soda pulp.
Johanson Wales & Sparre, Inc., Drottingholm, Gothenburg, 299 bls. dry soda pulp.
Castle & Overton, Inc., Drottingholm, Gothenburg, 1,400 bls. wood pulp.
Parsons & Whittemore, Inc., Drottningholm, Gothenburg, 150 bls. sulphate pulp.
Price & Pierce, Ltd., Malmen, Gothenburg, 125 bls. wood pulp.
J. Andersen & Co., Korsholm, Stockholm, 450 bls. sulphite.
Scandinavian Pulp Agency, Inc., Korsholm, Skutskar, 2,760 bls. wood pulp.
Pagel Horton & Co., Inc., Korsholm, Gefle, 5,000 bls. sulphite.
Bulkley Dunton & Co., Korsholm, ——, 875 bls. sulphite.
Brown Bros. & Co., Korsholm, Norrsundet, 5,500 bls. sulphate.
Scandinavian Pulp Agency, Inc., Korsholm, Wilstavarf, 2,500 bls. sulphate; 1,125 bls. sulphite.
Johanson Wales & Sparre, Inc., Korsholm, Wifstavarf, 750 bls. sulphite.
Perkins Goodwin & Co., Korsholm, Wifstavarf, 750 bls. sulphite.
Bulkley Dunton & Co., Korsholm, ——, 900 bls. sulphite.
Perkins Goodwin & Co., Argosy, Obbola, 7,700 bls. sulphate, 1,100 tons.
Castle & Overton, Inc., Reliance, Hamburg, 187 bls. wood pulp, 28 tons.

### WOOD FLOUR

B. L. Soberaki, Stavangerfjord, Frederickstad, 3,000 bags.

*(Continued on page 146)*



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SAN FRANCISCO 38 Natoma Street

**GENERAL DYESTUFF CORPORATION**

# Imports of Paper and Paper Stock

(*Continued from page 144*)

## BOSTON IMPORTS

WEEK ENDING OCTOBER 20, 1928

Brown Bros. & Co., Cristobal Colon, Coruna, 39 bls. old rope.
E. J. Keller Co., Inc., Median, ——, 67 bls. bagging.
Castle & Overton, Inc., Amasis, Germany, 3,773 bls. wood pulp.

## PHILADELPHIA IMPORTS

WEEK ENDING OCTOBER 20, 1928

Banco Com'l Italiane Trust Co., Sinsinawa, Leghorn, 82 bls. rags.
S. Birkenstein & Sons, Rigel, Genoa, 209 bls. old rope.
Interstate Trust Co., Rigel, Leghorn, 147 bls. rags.
Guaranty Trust Co., Rigel, Leghorn, 80 bls. rags.
E. J. Keller Co., Inc., Rigel, ——, 201 bls. rags.
Chemical National Bank, Cabo Torres, Bilbaso, 68 bls. rags.
Chemical National Bank, Ontario, Havre, 122 bls. rags.
Chase National Bank, Ontario, Havre, 20 bls. rags.
Chase National Bank, Ontario, Dunkirk, 217 bls. rags.
Union Bank & Trust Co., Ontario, Dunkirk, 482 bls. rags.
Castle & Overton, Inc., Culberson, So. America, 230 bls. rags.
Castle & Overton, Inc., Havelland, Germany, 517 bls. rags; 1,636 bls. wood pulp.
Castle & Overton, Inc., Bristol City, England, 90 bls. rags.
Castle & Overton, Inc., Manchester Shipper, England, 82 bls. rags.
Castle & Overton, Inc., Sacandaga, Belgium, 127 bls. rags.
Castle & Overton, Inc., McKeesport, France, 251 bls. rags.
M. Gottesman & Co., Inc., Talisman, Stockholm, 500 bls. wood pulp.
Bulkley Dunton & Co., Wanja, ——, 1,250 bls. wood pulp.

## BALTIMORE IMPORTS

WEEK ENDING OCTOBER 20, 1928

Banco Com'l Italiane Trust Co., Sinsinawa, Leghorn, 410 bls. rags.
E. M. Sergeant & Co., Argosy, Gothenburg, 598 bls. dry soda pulp, 101 tons.
Johanson Wales & Sparre, Inc., Argosy, Gothenburg, 598 bls. dry soda pulp, 101 tons.
The Borregaard Co., Inc., Argosy, Gothenburg, 250 bls. wood pulp, 50 tons.
Parsons & Whittemore, Inc., Argosy, Gothenburg, 133 bls. sulphite, 22 tons.
Pagel & Horton & Co., Inc., Argosy, Husum, 14,130 bls. sulphate, 2,355 tons.
Pagel & Horton & Co., Inc., Argosy, Hornefors, 7,140 bls. sulphite, 1,190 tons.
Lagerlcef Trading Co., Argosy, Helsingfors, 200 bls. pulp boards; 1,986 bls. wood pulp, 331 tons.
Leshner Paperstock Co., Sac City, Antwerp, 249 bls. bagging.
Congoleum Nairn Co., Sac City, Antwerp, 1,141 bls. rags; 147 bls. bagging.
S. Shapira & Son, Sac City, 72 bls. rags.
Bulkley Dunton & Co., Copenhagen, ——, 1,371 bls. wood pulp.
Bulkley Dunton & Co., Malmen, ——, 3,650 bls. wood pulp.
Bulkley Dunton & Co., Slemmestad, ——, 1,500 bls. wood pulp.
M. Gottesman & Co., Inc., Slemmestad, Stockholm, 6,780 bls. wood pulp.
M. Gottesman & Co., Inc., Talisman, Stockholm, 2,815 bls. wood pulp.
E. J. Keller Co., Inc., Burgerdyk, ——, 600 bls. wood pulp.
E. J. Keller Co., Inc., Westerdyk, ——, 900 bls. wood pulp.
Castle & Overton, Inc., Havelland, Germany, 4,460 bls .wood pulp.
Castle & Overton, Inc., ——, Germany, 1,449 bls. wood pulp.

## PORTLAND IMPORTS

WEEK ENDING OCTOBER 20, 1928

M. Gottesman & Co., Inc., Wanja, Stockholm, 1,000 bls. wood pulp.

## NORFOLK IMPORTS

WEEK ENDING OCTOBER 20, 1928

British American Tobacco Co., Sac City, Antwerp, 51 cs. printed cigarette wrappers.
Castle & Overton, Inc., Havelland, Germany, [illegible] bls. wood pulp.

## Directorate of Fir-Tex Corp. Complete

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., October 18, 1928.—The Fir-Tex Corporation, which has been in the process of organization for some months, now announces that the board of directors is complete with the addition of four new names early in October.

Two of the directors are men of prominence in other states. They are William Eibel, general manager and treasurer of the Rhinelander Paper Company, of Rhinelander, Wis., and W. B. Dean, general manager of the Diamond Match Company, of Chico, California. In addition to these are James D. Burns, banker-capitalist, of Condon, Oregon, and Charles A. Shea, of the J. F. Shea Company, Portland.

Mr. Eibel has decided to move his family to Oregon, where he can become actively interested in the Fir-Tex Corporation. He has been connected with the Rhinelander Company for 25 years and is considered an expert in wood products and wood fibers. He is credited with being among the first men in the country to produce glassine and grease-proof products, and also with the patented Eibel process used on Fourdrinier paper machines.

Mr. Dean's connection with the company is considered of valuable distinction, since the Diamond Match Company, among its other activities, operates 53 lumber yards in California. The other two new directors are welcomed for their wide acquaintance in the state and their financial and civic interest locally. All of the new men just added are said to have been heavy investors in the Fir-Tex Corporation.

The list of officials as it now stands complete is as follows:

Chairman of the board, Charles E. Dant; president, Hamlin F. McCormick; vice-president, Kenneth D. Dawson; vice-president and general manager, Arthur E. Millington; secretary-treasurer, William Eibel.

In addition to these men the board of directors includes: Herbert Fleishkacker, San Francisco; John S. Baker, Tacoma; Franklin T. Griffith and Tom G. Taylor, Portland.

The corporation expects to start construction of the new project at St. Helens, Oregon, shortly after the first of next year.

## Work on Paper Mill Getting Under Way

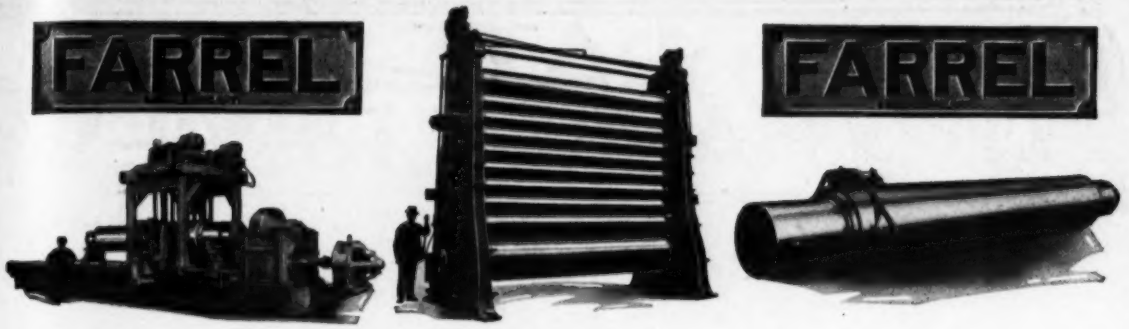
LYNCHBURG, Va., October 22, 1928.—A permit has been granted to the John H. Heald Company, of Lynchburg, to construct a new mill building to adjoin at the east or lower end. The city municipal bureau of inspection gave the permit. The new building will be 50 x 400 of steel frame with brick panels in the walls. The approximate cost will be $50,000. The preliminary work of clearing space has begun.

This is the next step in the plans made when the Mead Paper Board Corporation, of Dayton, Ohio, merged with the John H. Heald & Co. here. The purpose is to utilize the waste wood products from the tannic acid processing of the Heald Company. The new mill will provide the facilities.

Campbell King, of Dayton, construction engineer of the Mead concern, is here, has his office force installed in quarters and his foremen are lining up the work plans. Employment will be given to labor as rapidly as the progress of the building warrants and it is expected to have as many as 30 men at work when fully under way. It is expected to take six months, even though the work will be expedited as the new company desires use and occupancy as s oon as possible.

## Forestry Fire Flying Season Closed

The Ontario Forestry Air Service has virtually closed the flying season—most extensive in its five-year history. All operating bases have been closed except those at Sudbury and Temagami, and a single machine working out of Sioux Lookout. Since the early part of May, Captain Roy Maxwell reports, the service has made 3,877 flights and put in 6,000 actual hours of flying. Passengers and personnel to the number of 4,261 were carried, and 348,580 miles of territory patrolled. Geese and ducks are reported by pilots as very plentiful in the James Bay area. They are capable of causing serious damage, if not a crash, by colliding in numbers with a plane, and Capt. Maxwell, who landed recently at Hannah Bay, east of Moose Factory, had to delay some time beyond schedule because the numbers of wild-fowl made a take-off practically impossible.

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**FARREL CALENDERS** are equipped with Electric, Hydraulic or Ratchet Lift, all operated from the floor.

**FARREL ROLLS** are made as large as 298" on the face.

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Birmingham Iron Foundry, Derby, Conn., Est. 1836.

*Uncle Jake says—*

*"Selfishness is the illegitimate offspring of ambition and progression."*

We are selfish, however, in a purely legitimate way when we repeatedly call your attention to the merits of

**KVP PAPERS**

KALAMAZOO VEGETABLE PARCHMENT CO. KALAMAZOO, MICH.

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 24, 1928.

Trading in the local paper market was fairly active during the past week. Practically all the various grades are moving in good volume. Prices rule steady to firm and there is little talk of concessions around. Sales forces of the leading paper houses are booking some good orders and are mostly optimistic over the future outlook.

Production of news print is being maintained at around 80 per cent of capacity in the United States and Canada. Consumption is steadily expanding and supplies are going forward at an excellent pace. No radical changes have been reported in the position of the market although concessions are being made on contracts signed for 1929 requirements.

Steadiness prevails in the paper board market. Box board is in heavy request and quotations are quite firm. The fine paper market is exhibiting a strong undertone. Some improvement was also noticed in the demand for tissues. The coarse paper market is becoming more active and wrapping paper is still moving in heavy volume.

### Mechanical Pulp

The ground wood market is practically unchanged. Most of the business transacted of late has been along seasonal lines. Contract withdrawals of both imported and domestic mechanical pulp are proceeding in a normal manner for the season. Prices are generally holding to former levels and shading is infrequent, except on unusually large orders.

### Chemical Pulp

Mill interest in the different grades of imported and domestic chemical pulp is growing and there are a good number of inquiries around for future business. Bleached sulphite continues in an exceptionally strong position. Offerings of the better grades are decidedly scarce and quotations are steady to firm. Practically all the other varieties of chemical pulp are in steady demand.

### Old Rope and Bagging

Demand for domestic and imported old rope is fairly persistent. Supplies of manila rope are moving into consumption at a normal pace. Prices are generally holding to schedule. The bagging market continues rather quiet. Scrap bagging is moderately active and roofing bagging is in fair request. Quotations are holding to former levels.

### Rags

Most of the business transacted in the local rag market during the past week was along routine lines. Demand for the roofing grades is lighter than usual at this time of the year. Cotton cuttings are in fair request. The foreign rag market remains fairly steady. Quotations on the various grades of rags are holding to schedule, in most instances.

### Waste Paper

The undertone of the paper stock market is very strong with practically every grade sharing in the improvement. Special mixed papers, white news, strictly overissue, and strictly folded news, are particularly firm, while book stock is in better request than for some time. Old kraft machine compressed bales are also moving at an excellent pace. Prices are steady to firm.

### Twine

With wrapping paper moving in seasonal volume, the outlook for the twine market is encouraging. Demand for the various grades is gradually expanding and the market should continue active until the end of the year, at least. Prices are holding to schedule, in most instances, despite keen competition for desirable orders.

## Paper Trade in Red Cross Appeal

The paper trade in New York City again this year is cooperating actively with the American Red Cross in its roll call membership appeal, which opens annually on Armistice Day for the support of its extensive metropolitan welfare and relief and public health program.

Adam K. Luke of the West Virginia Pulp and Paper Company, again heads the activities as volunteer chairman of the special Paper Manufacturers and Dealers group and will follow essentially the same plan of intensive effort which brought such generous response from the personnel of the field under his chairmanship in the 1927 Roll Call.

This group is one of approximately 175 now being formed under the roll call of committee organization of the entire city. Each group, industrial, mercantile, or professional, will be directed as in the past by a representative leader in that field, serving as volunteer chairman, many of whom have already served in the same capacity in earlier Roll Calls.

Aid for the ex-service man and his dependents still constitutes a large factor of the Red Cross program in New York and government officials estimate that the peak of this work will not be reached before 1932. More than 3,345 disabled veterans, men still in service, and dependents received Red Cross service during the year, covering legal help, money loans and medical advice. Employment was found for 674 crippled or otherwise disabled veterans.

More than 600,000 surgical dressings were made for twenty city hospitals under the public health program, which, in addition to disaster relief preparedness, includes nursing service, first aid, and work in home hygiene and care of the sick.

## Forester in Portland

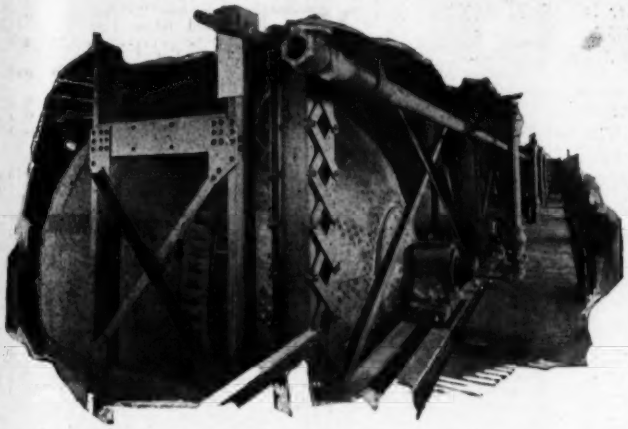
[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., October 19, 1928.—Ward Shepard in charge of the division of information of the department of public relations, United States forestry service, is in Oregon making an inspection of public relations activities in the district. Mr. Shepard is also secretary of the Society of American Foresters, and while in Portland was guest at a meeting of the group. The affair was a dinner at Thiele's, and was attended by paper men and forestry officials.

Besides Mr. Ward, there appeared on the program of the evening C. C. Heritage, engineer in pulp and paper research, Madison, Wis.; Carlile P. Winslow, director of the forest product's laboratory, Madison, Wis., and Dr. Haven Metcalf of the forestry pathology bureau of plant industry, Washington, D. C.

Mr. Ward spoke particularly about the decrease in man-caused fires in recent years, due both to public education along this line and to the intelligent thought given by private owners and their co-operation with federal agencies.

# Keeping Pace With Modern Bleaching Requirements



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Biggs Rotary Bleaching Boilers and Digesters have met the requirements of practical papermen in all types of plants producing *all* grades of stock under every possible condition for more than 40 years.

Now the new Biggs Rotary Bleaching Engine, capable of bleaching stock at variable consistencies, effectively meets the need for equipment to handle your most difficult bleaching problems.

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*for Years of Dependable Cooking and Bleaching*

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**Diamond Alkali Company · Pittsburgh, Pa.** ***and Everywhere***

# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 24, 1928.

BLANC FIXE.—Conditions in the blanc fixe market are practically unchanged. Demand for both the pulp and the powder is fairly persistent. The pulp is still quoted at from $42.50 to $45 00 per ton, in bulk, while the powder is selling at from 3½ to 3⅝ cents a pound, in barrels, at works.

BLEACHING POWDER.—Most of the business transacted in the bleaching powder market was along routine lines. The demand for this product continues light but prices are generally holding to schedule. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in large drums, at works.

CASEIN.—Business in the casein market is seasonal. Supplies are moving into consumption in fair volume. Domestic casein is now selling at from 15 cents to 17 cents per pound, while imported casein is quoted at from 16½ cents to 17 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is well up to average. Constant shipments are moving at a steady pace. Prices are steady. Solid caustic soda is quoted at from $2.90 to $2.95, while the flake and the ground are selling at from $3.30 to $3.35 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is in a sound position Both imported and domestic grades are in steady request. Imported china clay is still quoted at from $15 to $25 per ton, ship side. Domestic paper making clay is selling at from $8 to $9 a ton and pulverized at from $10 to $12 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. Prices are holding to former levels and shading is infrequent. Chlorine is selling at 3½ cents a pound, in tanks, or multi-unit cars, at works, on contract orders. The spot quotation ranges from 3¾ cents to 4 cents a pound.

ROSIN.—The rosin market continues to fluctuate. At the naval stores, the grades of gum rosin used in the paper mills are now quoted at from $9.20 to $9.25 per 280 pounds, ex dock, in barrels. Wood rosin is selling at from $7.15 to $7.95 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Trading in the salt cake market was fairly brisk. Contract withdrawals continue to go forward at a normal pace. Prices remain unaltered, in most instances. Salt cake is quoted at from $15 to $17 a ton, while chrome salt cake is selling at from $14 to $15 a ton, in bulk, at works.

SODA ASH.—Supplies of soda ash are moving into consumption in excellent volume. There are a fair number of inquiries around for future business. Contract quotations on soda ash, in car lots, per 100 pounds, according to grade, are still as follows: in bags, $1.32½, and in barrels, $1.55

STARCH.—The undertone on the starch market is strong. Production is being maintained in sufficient volume to take care of current requirements. Prices are steady and unchanged. Special paper making starch is still offered at $4.07 per 100 pounds, in bags, and at $4.24 per 100 pounds, in barrels.

SULPHATE OF ALUMINA.—Contract withdrawals of sulphate of alumina are being maintained at a satisfactory pace. Prices remain unaltered. Commercial grades of sulphate or alumina are quoted at from $1.40 to $1.45 and iron free at from $1.90 to $2.05 per 100 pounds, in bags, at works.

SULPHUR.—Producers of sulphur are experiencing a heavy demand for their product. Shipments against contract are proceeding in a normal manner. Prices are holding to schedule without difficulty. Sulphur is quoted at from $18 to $19 a ton, in bulk, at mine, on contract orders.

TALC.—The talc market was moderately active during the past week. The prevailing demand for this product is normal. Prices are holding to former levels. Domestic talc is quoted at from $16 to $18 a ton, in bulk, at eastern mines. Imported talc is selling at from $18 to $20 per ton, ship side.

# Market Quotations

## Paper

(F. o. b. Mill)

| | | |
|---|---|---|
| Ledgers | 11.00 | @38.00 |
| Bonds | 9.00 | @45.00 |
| **Writings—** | | |
| Extra Superfine | 14.00 | @32.00 |
| Superfine | 14.00 | @32.00 |
| Tub sized | 10.00 | @15.00 |
| Engine sized | 8.00 | @11.00 |
| **News—** | | |
| Rolls, contract | 3.25 | @ — |
| Rolls, transient | 3.25 | @ 3.50 |
| Sheets | 3.65 | @ 3.85 |
| Side Runs | 3.00 | @ 3.75 |
| **Book, Cased—** | | |
| S. & S. C. | 6.35 | @ 7.75 |
| M. F. | 6.25 | @ 7.75 |
| Coated and Enamel | 8.00 | @15.00 |
| Lithograph | 8.00 | @15.00 |
| **Tissues—Per Ream—** | | |
| White No. 1 | .75 | @ 1.00 |
| Anti-Tarnish | 1.10 | @ 1.90 |
| Colored | 1.00 | @ 2.00 |
| White No. 2 | .75 | @ .85 |
| Kraft | .90 | @ 1.00 |
| Manila | .75 | @ .85 |
| **Kraft—** | | |
| No. 1 Domestic | 6.50 | @ 6.75 |
| No. 2 Domestic | 5.25 | @ 5.50 |
| Southern | 4.75 | @ 5.25 |
| Imported | 6.50 | @ 7.00 |
| **Manila—** | | |
| No. 1 Jute | 9.00 | @ 9.25 |
| No. 2 Jute | 7.75 | @ 8.50 |
| No. 1 Wood | 4.75 | @ 5.25 |
| No. 2 Wood | 4.00 | @ 4.50 |
| Butchers | 3.75 | @ 4.25 |
| **Fibre Papers—** | | |
| No. 1 Fibre | 5.00 | @ 5.50 |
| No. 2 Fibre | 4.75 | @ 5.25 |
| Common Bogus | 2.75 | @ 3.00 |
| Screenings | 3.00 | @ 3.25 |
| Card Middles | 4.00 | @ 5.00 |
| **Glassine—** | | |
| Bleached, basis 25 lbs. | 13.00 | @16.00 |
| Bleached, basis 20 lbs. | 15.00 | @16.00 |

(Delivered New York)

| | | |
|---|---|---|
| **Boards—per ton—** | | |
| News | 45.00 | @47.50 |
| Straw | 52.50 | @55.00 |
| Chip | 42.50 | @45.00 |
| Binders' Boards | 65.00 | @67.50 |
| Sgl. Mla. Ll. Chip. | 50.25 | @52.75 |
| Wood Pulp | 80.00 | @85.00 |
| Container | 57.50 | @60.00 |
| 85 Test Jute Liner. | 55.00 | @57.50 |

## Mechanical Pulp

(Ex-Dock)

| | | |
|---|---|---|
| **No. 1 Imported—** | | |
| Moist | 28.00 | @31.25 |
| Dry | 32.00 | @34.00 |

(F. o. b. Mill)

| | | |
|---|---|---|
| No. 1 Domestic | 26.00 | @29.00 |
| Screenings | 15.00 | @20.00 |

## Chemical Pulp

(Ex-Dock, Atlantic Ports)

| | | |
|---|---|---|
| **Sulphite (Imported)—** | | |
| Bleached | 3.65 | @ 4.40 |
| Easy Bleaching | 2.80 | @ 2.90 |
| No. 1 strong unbleached | 2.50 | @ 2.70 |
| Mitscherlich unbleached | 2.65 | @ 3.25 |
| No. 2 strong unbleached | 2.40 | @ 2.60 |
| No. 1 Kraft | 2.50 | @ 2.75 |
| No. 2 Kraft | 2.40 | @ 2.50 |
| **Sulphate—** | | |
| Bleached | 3.75 | @ 3.85 |

(F. o. b. Pulp Mill)

| | | |
|---|---|---|
| **Sulphite (Domestic)—** | | |
| Bleached | 3.40 | @ 4.75 |
| Easy Bleaching Sulphite | 2.60 | @ 2.75 |
| News Sulphite | 2.40 | @ 2.65 |
| Mitscherlich | 3.00 | @ 3.70 |
| Kraft (Domestic) | 2.50 | @ 3.30 |
| Soda Bleached | 3.15 | @ 3.30 |
| **Sulphate Screenings—** | | |
| Coarse | .75 | @ .85 |
| Refined | 1.50 | @ 1.65 |

## Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

| | | |
|---|---|---|
| **Shirt Cuttings—** | | |
| New White, No. 1 | 11.00 | @11.50 |
| New White, No. 2 | 8.00 | @ 8.50 |
| Silesias No. 1 | 7.25 | @ 7.75 |
| New Unbleached | 10.50 | @11.00 |
| Washables | 4.25 | @ 4.75 |
| Fancy | 5.50 | @ 6.00 |
| Blue Overall | 6.75 | @ 7.25 |
| New Blue Prints | 5.25 | @ 5.50 |
| New Soft Blacks | 5.25 | @ 5.75 |
| Mixed Khaki Cuttings | 4.75 | @ 5.25 |
| Pink Corset Cuttings | 8.00 | @ 8.50 |
| O. D. Khaki Cuttings | 5.25 | @ 5.75 |
| Men's Corduroy | 3.75 | @ 4.25 |
| New Mixed Blacks | 3.50 | @ 3.75 |

Old Rags

| | | |
|---|---|---|
| **White, No. 1—** | | |
| Repacked | 5.50 | @ 6.00 |
| Miscellaneous | 4.50 | @ 5.00 |
| **White, No. 2—** | | |
| Repacked | 3.00 | @ 3.50 |
| Miscellaneous | 2.50 | @ 2.75 |
| St. Soiled, White | 2.00 | @ 2.15 |
| **Thirds and Blues—** | | |
| Repacked | 2.25 | @ 2.50 |
| Miscellaneous | 1.75 | @ 2.00 |
| Black Stockings | 3.25 | @ 3.75 |
| **Roofing Rags—** | | |
| Cloth Strippings | 1.70 | @ 1.80 |
| No. 1 | 1.70 | @ 1.80 |
| No. 2 | 1.55 | @ 1.65 |
| No. 3 | 1.30 | @ 1.40 |
| No. 4 | 1.25 | @ 1.35 |
| No. 5A | .95 | @ 1.05 |

## Foreign Rags

| | | |
|---|---|---|
| New Dark Cuttings | 2.50 | @ 3.00 |
| New Mixed Cuttings | 2.75 | @ 3.25 |
| New Light Silesias | 7.00 | @ 7.50 |
| Light Flannelettes | 7.50 | @ 8.00 |
| Unbleached Cottons | 10.00 | @11.00 |
| New White Cuttings | 10.50 | @11.50 |
| New Light Oxfords | 7.00 | @ 7.50 |
| New Light Prints | 5.50 | @ 6.50 |
| No. 1 White Linens | 7.25 | @ 8.00 |
| No. 2 White Linens | 5.50 | @ 6.25 |
| No. 3 White Linens | 4.50 | @ 5.00 |
| No. 4 White Linens | 3.00 | @ 3.50 |
| Old Extra Light Prints | 2.75 | @ 3.25 |
| Ord. Light Prints | 2.25 | @ 2.50 |
| Med. Light Prints | 1.90 | @ 2.10 |
| Dutch Blue Cottons | 2.25 | @ 2.50 |
| German Blue Linens | 2.50 | @ 2.75 |
| German Blue Cottons | 2.00 | @ 2.25 |
| Checks and Blues | 1.75 | @ 1.90 |
| Lindsay Garments | 1.85 | @ 1.90 |
| Dark Cottons | 1.65 | @ 1.75 |
| Old Shopperies | 1.55 | @ 1.65 |
| New Shopperies | 1.50 | @ 1.60 |
| French Blues | 2.10 | @ 2.25 |

## Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

| | | |
|---|---|---|
| **Gunny No. 1—** | | |
| Foreign | 1.60 | @ 1.70 |
| Domestic | 1.70 | @ 1.75 |
| Wool Tares, light | 1.60 | @ 1.65 |
| Wool Tares, heavy | 1.60 | @ 1.65 |
| Bright Bagging | 1.60 | @ 1.65 |
| Small Mixed Rope | 1.25 | @ 1.40 |
| **Manila Rope—** | | |
| Foreign | 3.35 | @ 3.65 |
| Domestic | 3.25 | @ 4.00 |
| New Burlap Cut | 2.75 | @ 3.00 |
| **Hessian Jute Threads—** | | |
| Foreign | 3.50 | @ 4.00 |
| Domestic | 3.25 | @ 3.50 |

## Old Waste Papers

(F. o. b. New York)

| | | |
|---|---|---|
| **Shavings—** | | |
| Hard, white, No. 1 | 3.25 | @ 3.50 |
| Hard, white, No. 2 | 2.40 | @ 2.55 |
| Soft, White, No. 1 | 2.55 | @ 2.65 |
| White envelope cuttings | 3.25 | @ 3.50 |
| **Flat Stock—** | | |
| Stitchless | 1.60 | @ 1.70 |
| Overissue Mag. | 1.60 | @ 1.70 |
| Solid Flat Book | 1.45 | @ 1.55 |
| Crumpled No. 1 | 1.05 | @ 1.15 |
| Solid Book Ledger | 2.00 | @ 2.10 |
| Ledger Stock | 1.60 | @ 1.75 |
| **Manilas—** | | |
| New B. B. Chips | .65 | @ .75 |
| New Env. Cut | 2.40 | @ 2.60 |
| New Cuttings | 1.60 | @ 1.85 |
| Extra No. 1 old | 1.25 | @ 1.35 |
| Print | .80 | @ .85 |
| Container | .72½ | @ .77½ |
| Bogus Wrapper | .75 | @ .85 |
| **Old Kraft Machine Compressed bales** | 1.85 | @ 1.95 |
| **News—** | | |
| No. 1 White News | 1.75 | @ 1.80 |
| Strictly Overissue | .85 | @ .95 |
| Strictly Folded | .75 | @ .85 |
| No. 1 Mixed Paper | .60 | @ .65 |
| Common Paper | .35 | @ .40 |

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## 400 tons daily

AMERICAN MADE FOR AMERICAN TRADE

**H. T. BRAND**
**COATING CLAY**
and
**High Grade Filler Clay**

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Water Tube Boilers Steam Superheaters
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| HOUSTON, TEXAS | Electric Building |
| LOS ANGELES | Central Building |
| NEW ORLEANS | 344 Camp Street |
| PHILADELPHIA | Packard Building |
| PHOENIX, ARIZ. | Heard Building |
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| SALT LAKE CITY | Kearns Building |
| SAN FRANCISCO | Sheldon Building |
| SEATTLE | L. C. Smith Building |
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| SAN JUAN, P. R. | Recinto Sur 51 |

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**ENGLISH or BAKER WOVEN**

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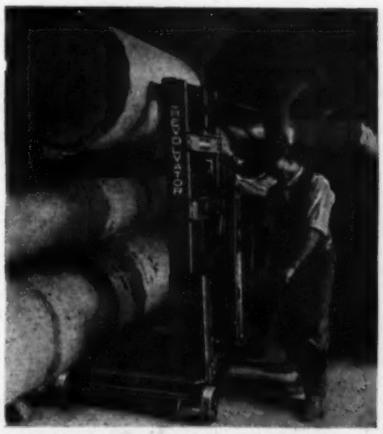
**FITCHBURG, MASS.**

***For 82 Years Makers of Fine Faced Felts for Papermakers***



The Revolvator used for storing heavy rolls of paper in the plant of one of Chicago's largest printers.

## Revolvators for Handling Paper

Handling paper in rolls, flat and boxed can be best accomplished with a Revolvator portable elevator. Many paper mills, warehouses, publishers and printers have found from experience that the Revolvator is the only device for such work. The Revolvator saves labor, does the work faster and safer and is far more economical than any other equipment. Send for descriptive bulletin P T and get the complete story —now.

*Portable and Stationary Elevators Liftrucks Storage Racks*

**REVOLVATOR CO.**
357 Garfield Avenue Jersey City, N. J.

### Twines

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Cotton— | | | |
| No. 1 | .39 | @ | .40 |
| No. 2 | .37 | @ | .38 |
| No. 3 | .36 | @ | .37 |
| B. C., 18 basis | .38 | @ | .40 |
| A. B. Italian, 18 basis | .48 | @ | .53 |
| Finished Jute— | | | |
| Dark 18 basis | .24 | @ | .25 |
| Light 18 basis | .27 | @ | .28 |
| Jute Wrapping, 3-6 Ply— | | | |
| No. 1 | .19 | @ | .21 |
| No. 2 | .18 | @ | .20 |
| Tube Rope— | | | |
| 4-ply and larger | .16 | @ | .17 |
| Fine Tube Yarn— | | | |
| 5-ply and larger | .21 | @ | .25 |
| 4-ply | .25 | @ | .29 |
| 3-ply | .28 | @ | .32 |
| Unfinished India— | | | |
| Basis | .13 | @ | .14 |
| Paper Makers Twine | | | |
| Balls | .11 | @ | .12 |
| Box Twine, 2-3 ply | .15 | @ | .17 |
| Jute Rope | .17 | @ | .19 |
| Ameri Hemp. 6 | .29 | @ | .31 |
| Sisal Hay Rope— | | | |
| No. 1 Basis | .16 | @ | .18 |
| No. 2 Basis | .14 | @ | .16 |
| Sisal Lath Yarn— | | | |
| No. 1 | .14 | @ | .16 |
| No. 2 | .12 | @ | .14 |
| Manila Rope | .22 | @ | .24 |

## CHICAGO

| | | | |
|---|---|---|---|
| All Rag Bond | .35 | @ | .41 |
| No. 1 Rag Bond | .25 | @ | .35 |
| No. 2 Rag Bond | .14 | @ | .25 |
| Water Marked Sulphite Bond | .09 | @ | .12 |
| Sulphite Bond | .06¾ | @ | .11 |
| Superfine writing | .18 | @ | .24 |
| No. 1 fine writing | .14 | @ | .18 |
| No. 2 fine writing | .12 | @ | .14 |
| No. 3 fine writing | .08½ | @ | .12 |
| No. 1 M. F. Book | .06½ | @ | .07¾ |
| No. 2 M. F. Book | .05¾ | @ | .06¾ |
| No. 1 S.&S.C. Book | .06¾ | @ | .07¾ |
| No. 2 S.&S.C. Book | .05¾ | @ | .06½ |
| Coated Book | .07½ | @ | .12 |
| Coated Label | .07½ | @ | .10 |
| News—Roll, mill | .03½ | @ | .04¼ |
| News—Sheets, mill | .03¾ | @ | .04¼ |
| No. 1 Manila | .04¼ | @ | .05¼ |
| No. 1 Fibre | .04¾ | @ | .05¼ |
| No. 2 Manila | .04¼ | @ | .04¾ |
| Butcher's Manila | .04 | @ | .04½ |
| No. 1 Kraft | .06¼ | @ | .06½ |
| Southern Kraft | .03¾ | @ | .04 |
| No. 2 Kraft | .04 | @ | .04¼ |
| Wood Pag Boards | .04¼ | @ | .06¾ |
| Sulphite Screenings | .03 | @ | .03¼ |
| Manila Tissue— | | | |
| 24x36 Sheet | .07 | @ | .07¾ |
| White Tissue— | | | |
| 20x30 Sheet | .07¼ | @ | .07½ |
| Boards, per ton— | | | |
| (Delivered Central Territory) | | | |
| Plain Chip | 37.50 | @ | 41.00 |
| Solid News | 47.50 | @ | — |
| Manila Lined Chip | 55.00 | @ | — |
| Container Lined— | | | |
| (Delivered Central Territory) | | | |
| 85 Test | 65.00 | @ | 70.00 |
| 100 Test | 70.00 | @ | — |

### Old Papers

(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.80 | @ | 2.90 |
| White Env. Cuttings | 2.90 | @ | 3.00 |
| No. 1 Soft Shavings | 2.50 | @ | 2.60 |
| No. 1 Mixed | 1.00 | @ | 1.05 |
| No. 2 Mixed | .90 | @ | 1.00 |
| Ledger & Writings | 1.55 | @ | 1.65 |
| Solid Books | 1.25 | @ | 1.35 |
| Blanks | 1.70 | @ | 1.80 |
| Krafts | 1.90 | @ | 2.00 |
| New Kraft Cuts | 2.25 | @ | 2.35 |
| Manila Envelope Cuttings | 2.00 | @ | 2.10 |
| Ex. No. 1 Manila | 1.55 | @ | 1.65 |
| Print Manila | .90 | @ | 1.00 |
| Folded News (overissue) | .65 | @ | .75 |
| Old Newspapers— | | | |
| No. 1 | .65 | @ | .75 |
| No. 2 | .60 | @ | .65 |
| Mixed Papers— | | | |
| No. 1 | .70 | @ | .80 |
| Roofing Stocks— | | | |
| (F. o. b. Chicago, net cash) | | | |
| No. 1 | 30.00 | @ | — |
| No. 2 | 28.00 | @ | — |

## PHILADELPHIA

### Paper

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Bonds | .07 | @ | .40 |
| Ledgers | .11 | @ | .40 |
| Writings— | | | |
| Superfine | .13 | @ | .18 |
| Extra fine | — | @ | .22 |
| Fine | .20 | @ | .26½ |
| Fine, No. 2 | .16 | @ | .25 |
| Fine, No. 3 | .12 | @ | .20 |
| Book, M. F. | .06 | @ | .07 |
| Book, S. S. & C. | .06 | @ | .07½ |
| Book, Coated | .11 | @ | .16 |
| Coated Lithograph | .09 | @ | .12 |
| Labe | .09 | @ | .12 |
| News | .03¾ | @ | .04 |
| No. 1 Jute Manila | .08½ | @ | .09 |
| Manil Sul., No. 1 | .04½ | @ | .06 |
| Manil No. 2 | .04 | @ | .04½ |
| No. 2 Kraft | .05½ | @ | .06½ |
| No. 1 Kraft | .06½ | @ | .07 |
| Common Bogus | .02¾ | @ | — |
| Straw Board | 52.50 | @ | 75.00 |
| News Board | 45.00 | @ | — |
| Chip Board | 42.50 | @ | — |
| Wood Pulp Board | 4.50 | @ | 5.00 |
| (Carload Lots) | | | |
| Binder Boards— | | | |
| No. 1, per ton | 80.00 | | |
| No. 2, per ton | 75.00 | | |
| Carload lots | 60.00 | @ | 70.00 |
| Tarred Felts— | | | |
| Regular | 53.00 | @ | 55.00 |
| Slaters (per roll) | .84 | @ | .94 |
| Best Tarred, 1-ply (per roll) | 1.85 | @ | 1.95 |
| Best Tarred, 2-ply (per roll) | 1.44 | @ | 1.54 |
| Best Tarred, 3-ply | 1.93 | @ | 2.08 |

### Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1 | .10½ | @ | .11 |
| New White, No. 2 | .07 | @ | .07½ |
| Light Silesias | .07 | @ | .07½ |
| Silesias, No. 1 | .07½ | @ | .08 |
| Black Silesias, soft | .05 | @ | .05½ |
| New Unbleached | .10½ | @ | .11 |
| Washable, No. 1 | .04½ | @ | .05 |
| Washable, No. 2 | .03 | @ | .03½ |
| Fancy | .05½ | @ | .06 |
| Cottons—according to grades— | | | |
| Blue Overall | .07½ | @ | .08 |
| New Blue | — | @ | .04 |
| New Black Soft | .05 | @ | .05¾ |
| New Light Seconds | .02½ | @ | .03 |
| New Dark Seconds | 1.85 | @ | 2.00 |
| Khaki Cuttings— | | | |
| No. 1 O. D. | .05½ | @ | .05¾ |
| No. 2 Mixed | .04½ | @ | .04¾ |
| Corduroy | .03 | @ | .03½ |
| New Canvas | .08½ | @ | .09 |
| New Black Mixed | .03¾ | @ | .04½ |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign | 1.65 | @ | 1.80 |
| Domestic | 1.75 | @ | 2.00 |
| Manila Rope | 3.50 | @ | 4.00 |
| Sisal Rope | 1.50 | @ | — |
| Mixed Rope | 1.10 | @ | 1.25 |
| Scrap Burlaps— | | | |
| No. 1 | 1.50 | @ | 1.60 |
| No. 2 | 1.15 | @ | 1.25 |
| Wool Tares, heavy | 3.00 | @ | — |
| Mixed Strings | 1.15 | @ | 1.25 |
| No. 1, New Light Burlap | 2.50 | @ | 2.75 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |

### Old Papers

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 3.20 | @ | 3.25 |
| No. 2 Hard White | 2.75 | @ | 3.00 |
| No. 1 Soft White | 2.50 | @ | 2.60 |
| No. 2 Soft White | 1.90 | @ | 2.00 |
| No. 1 Mixed | 1.50 | @ | 1.60 |
| No. 2 Mixed | .90 | @ | 1.00 |
| Solid Ledger Stock | 1.60 | @ | 1.65 |
| Writing Paper | 1.50 | @ | 1.60 |
| No. 1 Books, heavy | 1.50 | @ | 1.60 |
| No. 2 Books, light | 1.20 | @ | 1.25 |
| No. 1 New Manila | 2.40 | @ | 2.50 |
| No. 1 Old Manila | 1.50 | @ | 1.60 |
| Print Manila | .95 | @ | 1.00 |
| Container Manila | .85 | @ | .90 |
| Old Kraft | 2.25 | @ | 2.30 |
| Common Paper | .55 | @ | .60 |
| No. 1 Mixed Paper | .55 | @ | .60 |
| Straw Board, Chip | .65 | @ | .75 |
| Binders Board, Chip | .65 | @ | .75 |
| Overissue News | .90 | @ | .95 |
| Old Newspaper | .60 | @ | .65 |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | 4.25 | @ | 4.50 |
| Miscellaneous | 3.50 | @ | 3.75 |
| White, No. 2— | | | |
| Repacked | .02¼ | @ | .02¾ |
| No. 2 | 1.40 | @ | 1.50 |
| No. 3 (Roofing) | 1.15 | @ | 1.25 |
| No. 4 | 1.25 | @ | — |
| No. 5A | .85 | @ | .90 |
| B | .80 | @ | .85 |
| C | .70 | @ | .80 |
| Thirds and Blues— | | | |
| Repacked | 2.00 | @ | 2.25 |
| Miscellaneous | 1.60 | @ | 1.80 |
| Black Stockings (Export) | 3.90 | @ | 4.25 |
| Roofing Stock— | | | |
| Foreign No. 1 | 1.70 | @ | 1.85 |

## BOSTON

### Paper

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ledgers— | | | |
| Sulphite | .07½ | @ | .15 |
| Rag content | .15 | @ | .30 |
| All rag | .38 | @ | .52½ |
| Bonds— | | | |
| Sulphite | .06½ | @ | .11½ |
| Rag content | .15 | @ | .30 |
| All rag | .36½ | @ | .65 |
| Writings | .07 | @ | .20 |
| Superfines | .11 | @ | .31 |
| News | .03½ | @ | .04 |
| Book, Super | .06 | @ | .09 |
| Book, M. F. | .05¾ | @ | .08½ |
| Book, Coated | .08½ | @ | .20 |
| Coated Litho | .09 | @ | .12 |
| Label | .09½ | @ | .15 |
| Jute Manila No. 1 | .11 | @ | .13 |
| Manila, Sul. No. 1 | .04¾ | @ | .06½ |
| Manila, Sul. No. 2 | .03¾ | @ | .04½ |
| No. 1 Kraft | .05½ | @ | .06½ |
| No. 2 Kraft | .04 | @ | .04¾ |
| Common Bogus | .02 | @ | .02¾ |
| Delivered New England points | | | |
| Straw Boards, rolls .009 | | | 52.50 |
| Straw Board in Sheets, basis 35s to 70s | | | 54.50 @ 55.00 |
| Filled News Board | | | 45.00 |
| Chip Board | | | 42.50 |
| Single Manila Pulp Lined Board | | | 52.50 @ 57.50 |
| Single White, Patent Coated Newsboard Bender | | | 70.00 @ 80.00 |
| Wood Pulp Board | | | 80.00 @ 85.00 |
| Binder Boards | | | 70.00 @ 75.00 |
| (F. o. b. Mill) | | | |
| Tarred Felts— | | | |
| Regular, carload lots | | | 63.00 @ — |

### Old Papers

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 3.25 | @ | 3.75 |
| No. 2 Hard White | 2.60 | @ | 2.90 |
| No. 1 Soft White | 2.50 | @ | 2.60 |
| No. 1 Mixed | 1.10 | @ | 1.15 |
| No. 2 Mixed | .85 | @ | .90 |
| Solid Ledger Stock | 2.35 | @ | 2.45 |
| No. 1 Books, Heavy | 1.45 | @ | 1.55 |
| No. 1 Books, Light | — | @ | 1.15 |
| Manila Env. Cuttings | 2.00 | @ | 2.25 |
| No. 1 Old Manila | 1.20 | @ | 1.25 |
| White Blank News | 1.70 | @ | 1.75 |
| Old Kraft | 2.00 | @ | 2.10 |
| Print Manila | .80 | @ | .90 |
| No. 1 Mixed Paper | .60 | @ | .65 |
| Overissue News | .70 | @ | .75 |
| Old Newspapers | .75 | @ | .80 |
| Box Board, Chip | .65 | @ | — |

### Bagging

(Price f. o. b. Boston)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | — | @ | 1.60 |
| Manila Rope— | | | |
| Foreign | 3.25 | @ | 3.50 |
| Domestic | 3.25 | @ | 3.50 |
| Mixed Strings | .90 | @ | 1.00 |
| Scrap Burlaps | 1.45 | @ | 1.50 |
| Scrap Sisal | 1.25 | @ | 1.30 |
| Scrap Sisal for anreading | 1.60 | @ | 1.70 |
| Wool Tares, heavy | — | @ | 1.30 |
| New Burlap Cutting | 1.90 | @ | 2.00 |

### Domestic Rags (New)

(Price f. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White No. 1 | .09 | @ | .10 |
| Silesias, No. 1 | .06 | @ | .06½ |
| New Unbleached | .09½ | @ | .10 |
| Fancy | .04 | @ | .04½ |
| Washable | .04 | @ | .04½ |
| Cottons—According to grades | | | |
| Blue Overalls | .06 | @ | .06½ |
| New Black, soft | .04 | @ | .04½ |
| Khaki Cuttings | .04 | @ | .04½ |
| Corduroy | .03 | @ | .03½ |
| New Canvas | .08 | @ | .08½ |

### Domestic Rags (Old)

(Price f. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas | .04½ | @ | — |
| White No. 1— | | | |
| Repacked | 4.75 | @ | 5.25 |
| Miscellaneous | 5.00 | @ | — |
| White No. 2— | | | |
| Repacked | .04½ | @ | .05 |
| Miscellaneous | 03½ | @ | .04 |
| Twos and Blues | — | @ | 2.50 |
| Thirds and Blues— | | | |
| Repacked | 2.00 | @ | 2.15 |
| Miscellaneous | 1.75 | @ | 1.90 |
| Roofing Stock— | | | |
| No. 1 | 1.75 | @ | 1.85 |
| No. 2 | 1.45 | @ | 1.55 |
| No. 3 | 1.05 | @ | 1.10 |
| No. 4 | 1.10 | @ | 1.15 |

### Foreign Rags

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons | 1.60 | @ | 1.65 |
| New No. 1 Shirt Cuttings | 9.00 | @ | 10.00 |
| Dutch Blues | 2.00 | @ | 2.12½ |
| Lace Curtains | 5.50 | @ | — |
| New Checks & Blues | 4.50 | @ | 4.65 |
| Old Fustians | 1.90 | @ | — |

## TORONTO

### Paper

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Bond— | | | |
| No. 1 Sulphite | .12½ | @ | — |
| No. 2 Sulphite | .10¾ | @ | — |
| No. 1 Colored | .13½ | @ | — |
| No. 2 Colored | .11¾ | @ | — |
| Ledgers (sulphite) | — | @ | — |
| Ledgers, No. 1 | .36 | @ | — |
| Ledgers, No. 2 | .27 | @ | — |
| Writing | .09½ | @ | .10 |
| News f. o. b. Mills— | | | |
| Rolls (carloads) | 3.25 | @ | — |
| Sheets (carloads) | 3.75 | @ | — |
| Sheets (2 tons or over) | 4.00 | @ | — |
| Book— | | | |
| No. 1 M. F. (carloads) | 7.50 | @ | — |
| No. 2 M. F. (carloads) | 7.25 | @ | — |
| No. 3 M. F. (carloads) | 7.00 | @ | — |
| No. 1 S. C. (carloads) | 8.00 | @ | — |
| No. 2 S. C. (carloads) | 7.75 | @ | — |
| No. 3 S. C. (carloads) | 7.50 | @ | — |
| No. 1 Coated and Litho | 14.50 | @ | — |
| No. 2 Coated and Litho | 13.50 | @ | — |
| No. 3 Coated and Litho | 12.75 | @ | — |
| Coated tinted | .15 | @ | — |
| Wrapping— | | | |
| Rag Brown | 4.95 | @ | — |
| White Wrap | 5.25 | @ | — |
| "D" Manila | 5.80 | @ | — |
| No. 1 Manila | 6.65 | @ | — |
| Fiber | 6.65 | @ | — |
| Kraft, M. F. | 7.00 | @ | — |
| M. G. | 7.00 | @ | — |

### Pulp

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ground Wood | 30.00 | @ | 31.00 |
| Sulphite easy bleaching | 62.00 | @ | — |
| Sulphite news grade | 62.00 | @ | — |
| Sulphite, bleached | 75.00 | @ | — |
| Sulphate | 65.00 | @ | — |

### Old Waste Paper

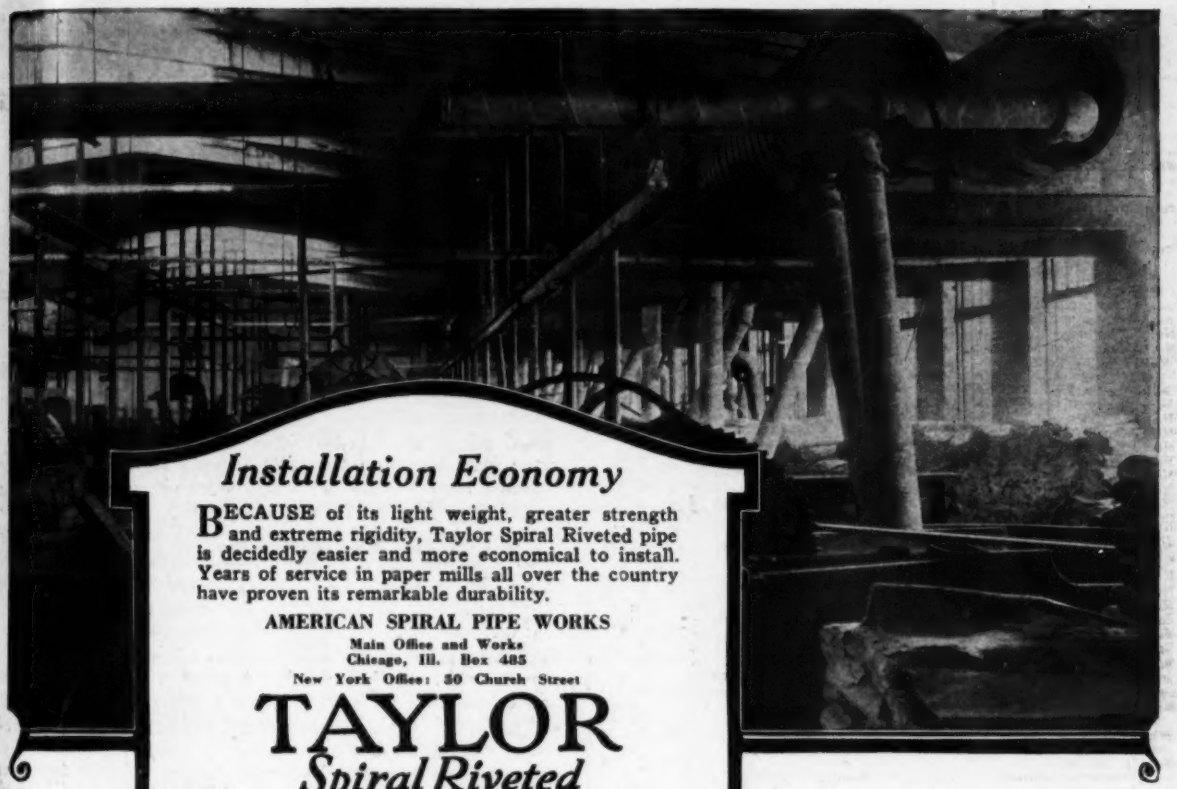
(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut | 3.00 | @ | — |
| Soft White Book Shavings | 2.85 | @ | — |
| White Blk. News | 1.60 | @ | — |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | 1.40 | @ | — |
| Light and Crumpled Book Stock | 1.25 | @ | — |
| Ledgers and Writings | 1.50 | @ | — |
| Solid Ledgers | 1.50 | @ | — |
| Manilas— | | | |
| New Manila Cut | 1.50 | @ | — |
| Printed Manilas | 1.00 | @ | — |
| Kraft | 2.25 | @ | — |
| News and Scrap— | | | |
| Strictly Overissue | .80 | @ | — |
| Strictly Folded | .80 | @ | — |
| No. 1 Mixed Paper | .70 | @ | — |

### Domestic Rags

(Price to mills, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings | .11½ | @ | — |
| Fancy Shirt Cuttings | .05½ | @ | — |



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# Paper Mill Stocks and Bonds

Quoted by Taylor & White, 45 Wall street, New York City, to whom all inquiry for quotations on these or any other Securities is referred.

| BONDS | BID | ASKED |
|---|---|---|
| Abitibi Power & Paper 5s, 1943 | 90 | 91 |
| Abitibi Power & Paper 6s, serially to 1934 | 100 | 102 |
| American Writing Paper 6s, 1947 | 81 | 87 |
| Bastrop Pulp & Paper 6½s, 1940 | 103 | 105½ |
| Bedford Pulp & Paper 6½s, 1942 | 97 | 100 |
| Belgo-Canadian Paper 6s, 1943 | 100 | 103 |
| British-Columbia Pulp & Paper 6s, 1950 | 89 | 92 |
| Brown Paper Mills Serial 6s, 1941 | 97 | 100 |
| Brown Company 5½s, 1946 | 98 | 101 |
| Bryant Paper 6s, 1942 | 98 | 101½ |
| Canadian Paper Board 7s, 19337 | 97 | 99½ |
| Cape Breton Pulp & Paper 6s, 1932 | 103 | ... |
| Celotex Company 6s, 1929 | 95 | 99 |
| Celotex Company 6½s, 1939 | 100 | 102 |
| Celotex Company of Chicago, Debenture 6s, 1936 | 95 | 98 |
| Central Paper Company Serial 6½s, 1942 | 86 | 89 |
| Central Paper 7s, 1934 | 78 | ... |
| Champion Coated Paper Serial 6½s, 1934 | 100 | ... |
| Champion Coated Fibre Notes 6s, 1941 | 100 | 102 |
| Champion Fibre Notes 6s, 1941 | 100 | 102 |
| Champion Fibre Notes 8s, 1930 | 95 | ... |
| Champion Paper Corp. 6s, 1945 | 95 | 98 |
| Container Corp. of America Debenture 6s, 1936, ex-warrants | 101 | 104 |
| Continental Paper Products 6½s, 1943 | 90 | 99 |
| Cornell Wood Products 7½s, 1937 | 103 | ... |
| Crown Willamette 6s, 1951 | 101 | 102 |
| Dells Paper & Pulp Serial 6s, 1938 | 95 | 98 |
| Dixon Board Mills Serial 6s, 1942 | 80 | ... |
| Donnaconna Paper 5½s, 1948 | 93 | ... |
| Eastern Manufacturing Co. 7s, 1938 | 97 | 100 |
| Escanaba Paper Serial 6s, 1939 | 98 | 100 |
| Escanaba Paper 6½s, 1935 | 96 | 99 |
| Filer Fibre Serial 7s, 1935 | 90 | 95 |
| Fort Irange Paper 7s, 1942 | 101 | ... |
| Fort William Paper 6s, 1946 | 100 | 104 |
| Fraser Company 6s, 1950 | 103 | 105 |
| Hammermill Paper Serial 6s, 1939 | 100 | ... |
| Hawley Pulp & Lumber 6s, 1946 | 96 | ... |
| Hawthorne Paper Company 6s, 1937 | 80 | ... |
| Hoberg Paper & Fibre 7s, 1937 | 94 | 97 |
| Industrial Fibre Corp. Debenture 8s, 1933 | 100 | ... |
| International Paper 6s, 1955 | 102 | 103 |
| International Paper 5s, 1947 | 98 | 100 |
| Itasca Paper & Prairie River Power Serial 5½s, 1938 | 99½ | ... |
| Itasca Paper & Prairie River Power Serial 6s, 1938 | 99 | ... |
| Jessup & Moore First 6s, 1945 | 83 | 90 |
| Kalamazoo Vegetable Parchment 6s, 1938 | 99 | 101 |
| Lake Superior Paper 6s, 1941 | 105 | 108 |
| Marathon Paper Mills Serial 5½s, 1942 | 99 | 101 |
| Marinette & Menominee 7½s, 1936 | 103 | 105 |
| Mead Pulp & Paper 5% Notes Serially, 1937 | 95 | 100 |
| Mead Fibre 7s, 1937 | 97 | 101 |
| Minnesota Ontario Paper Serial 6s, 1945 | 97½ | 100 |
| Murray Bay Paper Serial 6½s, 1947 | 102 | 105 |
| Munissing Paper Serial 6s, 1936 | 98 | ... |
| Nekoosa Edwards Paper 6s, 1928-42 | 96 | ... |
| Ontario Pulp & Paper 6s, 1931 | 108½ | 110½ |
| Orono Pulp & Paper 6s, 1943 | 99 | ... |
| Orono Pulp & Paper 5s, 1941 | 96½ | ... |
| Oswego Falls Corp. 6s, 1941 | 99 | 102 |
| Parker-Young Company 6½s, 1944 | 98 | 100 |
| Paterson Parchment Paper 6s, 1938 | 101 | 103 |
| Penobscot Chemical Fibre 6s, 1942 | 102 | 105 |
| Port Alfred Pulp & Paper 5½s, 1947 | 98 | 100 |
| Price Brothers 6s, 1943 | 105 | ... |
| Provincial Paper 5½s, 1947 | 98½ | ... |
| Queen City Paper 7s, 1933 | 98 | ... |
| River Raisin Paper 6s, 1936 | 98 | 100 |
| Riordan Pulp & Paper 6s, 1942 | 102 | 104 |
| Rolland Paper 6s, 1937 | 99 | 101 |
| St. Croix Paper Serial 5s, 1937 | 99 | ... |
| St. Helen Pulp & Paper 6½s, 1931 | 99 | 102 |
| St. Maurice Valley Corp. 6s, 1945 | 101 | 104 |
| St. Maurice Valley Corp. 5½s, 1947 | 98½ | 100½ |
| St. Regis Paper of Canada 6s,, 1931 | 100 | 101½ |
| St. Regis Paper of Canada 6½s, 1934 | 100 | 102 |
| Smith (Howard) Paper Mills 7s, 1941 | 104 | 106 |
| Spanish River Pulp & Paper 6s, 1931 | 108 | 110 |
| Stevens-Thompson Paper 6s, 1942 | 94 | 96 |
| Taggart Brothers 6s, 1944 | 95 | 100 |
| Tait Paper & Color Industries 6s, 1934 | 88 | 92 |
| Ticonderoga Pulp & Paper 5s, 1930 | 94 | ... |
| Ticonderoga Pulp & Paper 6s, 1940 | 100 | 102 |
| Tomahawk Kraft Paper 6s, 1938 | 98 | ... |
| Tomahawk Pulp Paper 7s, 1932 | 99 | ... |
| Tonawanda Paper 5½s, Series 1941 | 99 | 102 |
| Union Bag & Paper Power 6s, 1932 | 98 | 100 |
| United Wall Paper Factories 6s, 1947 | 96 | 99 |
| Warren (S. D.) Company 6s, 1945 | 103 | 105 |
| Watab Paper 6½s, 1942 | 102 | ... |
| Waterway Paper Products 6s, 1931 | 100 | 101½ |
| Wayagamack Pulp & Paper 6s, 1951 | 103 | 105 |
| Westfield River Paper Serial 7s, 1943 | 89 | 93 |
| Whitmer-Parson Pulp & Lumber 8s, 1938 | 20 | 25 |
| Whitaker Paper 7s, 1942 | 108 | 110 |

| STOCKS | BID | ASKED |
|---|---|---|
| American Box Board, Pfd. | 9¼ | 10¼ |
| American Box Board, Com. | 9¼ | 10¼ |
| Am. Tissue Mills, 7% Pfd. | 90 | 93 |
| British Columbia P. & P. Pfd. | 65 | 75 |
| Brompton Pulp & Paper, 8% Pfd. | 100 | ... |
| Champion Fibre, 7% Pfd. | 108 | 110 |
| Diem & Wing, 7% Pfd. | 92 | 97 |
| Eastern Mfg. Co. 1st Pfd. | 55 | ... |
| Great Northern Paper, Com. | 75 | 78 |
| Hammermill Paper, new 6% Pfd. | 100 | ... |
| Hinde & Dauch, Com. | 125 | None Off. |
| Hinde & Dauch, 6% Pfd. | 102 | None Off. |
| Holyoke Card & Paper | 160 | None Off. |
| Marathon Paper Mills, Com. | 150 | ... |
| Mengel Co., Pfd. | 102 | 104 |
| Midwest Box Co., 8% Pfd. | 98 | 102 |
| Midwest Box Co., 6% Pfd. | 95 | 99 |
| Louis De Jonge Co., 7% Pfd. | 94 | 97 |
| Oxford Papers, Com. | 195 | ... |
| Oxford Paper Co., Pfd. | 108 | 111 |
| Penobscot Chemical Fibre, Com. | 80 | ... |
| Richardson Co., Com. | 170 | ... |
| Sabin Robbins Paper Co., 8% Pfd. | 105 | 110 |
| St. Croix Paper | 155 | ... |
| St. Regis Paper Co., 7% Cum. Pfd. | 105 | 108 |
| Westfield River Paper Co., 1st Pfd. | Wanted | None Off. |
| West Virginia Pulp and Paper Company | 55 | 57 |
| West Virginia Pulp and Paper, Pfd. | 100 | 103 |
| Whittaker Paper, 7% Cum. Pfd. | 105 | None Off. |

## American Writing Makes Many Improvements

The American Writing Paper Company has been making numerous improvements during the year at its plants at Holyoke, Mass. Among the major work which it is planned to complete during the year 1928 is the following:

At the Parsons Division a filter plant having a capacity of two million gallons of water per day has been added. The large concrete portion of the plant consists of a sedimentation basin where the water being admitted is treated with alum so that the foreign matter in suspension will settle before the water is discharged in the four gravity filters of the Norwood Engineering Company's make. The plant is so designed that three additional filters can be installed at a later date. These, however, will replace three old filters located in another part of the mill.

At the Beebe & Holbrook and Wouregan Divisions a new boiler plant and stack is in course of erection. This new plant is to replace the old boiler house and consists of a brick building with steel columns, steel roof trusses and a wood roof, approximately 45 by 55 feet erected by the Casper Ranger Company and will house three 300 hp. Union boilers of the single drum type, equipped with some automatic Perfection Stokers. A new hollow tile chimney 7 feet in diameter by 125 feet high is being installed by the Rust Engineering Company to furnish draft to the boilers. Although provisions have been made for one additional boiler and coal and ash-handling facilities, this latter equipment will not be installed until a later date.

At the Beebe & Holbrook and Wauregan Divisions, several other additions are also being made to facilitate the handling of the paper through the finishing department. This is a three story brick addition with steel columns, steel floor beams and wood flooring, which covers an area of about 40 feet square providing an increase in floor space of approximately 4500 square feet.

The bridge connection between the Beebe & Holbrook and Wauregan Divisions will facilitate the handling of finished stock between the two plants and will provide for a continuous flow of high grade papers being finished at these divisions.

The construction work being done at the Albion Division will replace the walls and roofs of buildings housing two of the paper machines. These are of brick construction with steel roof trusses and wood roofs. At this plant additional room is being provided to house the new motor driven jordans which are to be installed at an early date. At this plant, also, it is planned to replace the six water wheels with two new high efficiency wheels.

## Cleveland-Akron Bag Plant Sold

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, October 22, 1928.—Information received here indicates that the lands, building and equipment of the Cleveland-Akron Bag Company were bought last week in the name of the Union Trust Company, as trustee, at sheriff's sale for $676,667. The company had an appraisal value of $1,015,000 but attorneys representing the purchasers bid it in at the amount stated.

The sale followed a foreclosure suit filed by the Union Trust Company, of Cleveland, which held notes on the company in the amount of $92,000. The property includes, besides the Cleveland factory buildings, approximately 235 acres of land in Boston Mills, Ohio.

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ESTABLISHED 1872
JOURNAL

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FIFTY-SEVENTH YEAR

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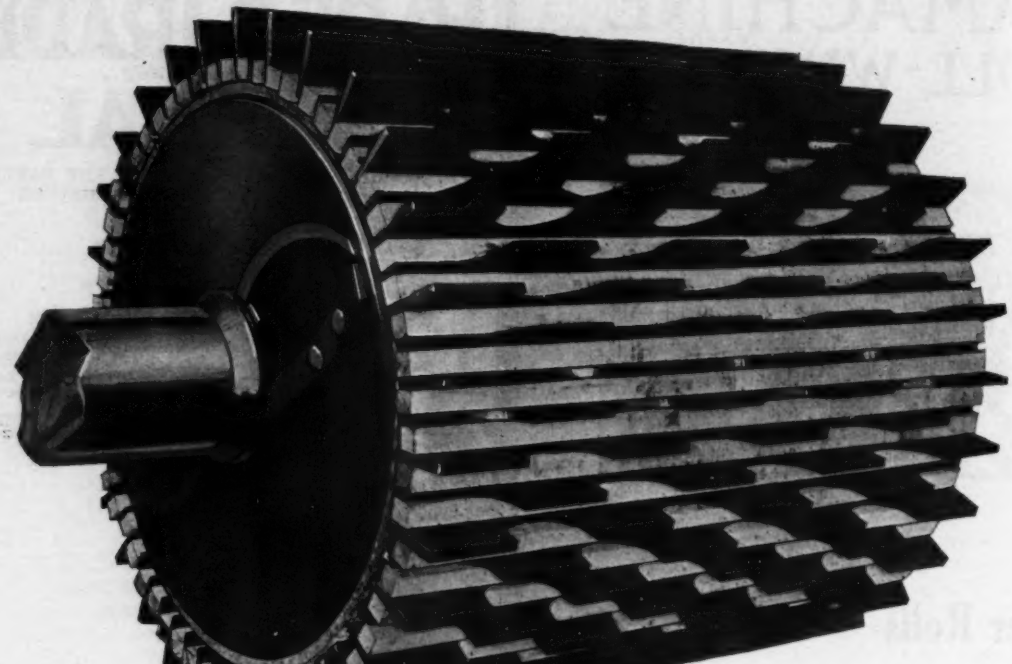

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